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GOVERNMENT ASSISTANCE TO INVENTION AND RESEARCH: A LEGISLATIVE HISTORY

STUDY OF
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PATENTS, TRADEMARKS, AND COPYRIGHTS
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UNITED STATES SENATE
EIGHTY-SIXTH CONGRESS, FIRST SESSION
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STUDY NO. 22

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[1] The late Hon. William Langer, while a member of this Committee, died on November 8, 1959.

FOREWORD

This study, by Barbara H. Jibrin of the Legislative Reference Service, was prepared for the Subcommittee on Patents, Trademarks, and Copyrights as part of its study of the U.S. patent system, conducted pursuant to Senate Resolution 53 of the 86th Congress, 1st session. Chapters 5–7 of part 2 were written by Catherine S. Corry, Legislative Reference Service. Prepared under the supervision of John C. Stedman, associate counsel for the subcommittee, it is one of several historical digests covering important and recurring congressional proposals for encouraging invention, research, and development through amendment of the patent laws and other means. Five such histories have previously been published, dealing respectively with the test of "invention," recordation of patent agreements, compulsory licensing, Patent Office fees, and a single court of patent appeals.

How to provide more encouragement, stimulus, and direction to inventive and research effort, both within the Government and outside of it, is a subject that has received increasing attention in recent times. As Mrs. Jibrin's study shows, however, inquiries and legislation of this type are not new. Efforts to provide such assistance have taken many forms, including special provisions under the patent laws, such as patent extensions and waiver of patent fees; special governmental awards to both Government employees and private individuals; and the creation of special Government agencies to sponsor, channel, subsidize, and otherwise stimulate and direct research, invention, and creativeness. These latter have included such organizations as the Smithsonian Institution, the National Research Council and Academy of Sciences, the National Inventors Council, the National Science Foundation, and many others. The current interest in these matters is evidenced by the enactment in 1958 of important research and development provisions in the new Space Act and the Small Business Act of 1958. This study includes developments through the end of the 85th Congress in 1958.

This study is presented as a result of the work of Mrs. Jibrin and Miss Corry for the consideration of the members of the subcommittee. It does not represent any conclusion of the subcommittee or its members.

JOSEPH C. O'MAHONEY,
Chairman, Subcommittee on Patents, Trademarks, and Copyrights, Committee on the Judiciary, U.S. Senate.

December 28, 1959.

CONTENTS

	Page
Introduction	1
Part one. Inventions made by Government employees:	
I. Common law rights	3
II. The act of 1910 and the 1952 amendment thereto	4
A. Early history	4
B. Public Law 582 (82d Cong.), July 7, 1952	5
1. Legislative history	5
2. Important provisions	5
3. Significant testimony and comments	6
III. The act of 1883 and the 1928 amendment thereto	6
A. Early history	6
B. Bills introduced and considered, 1919–25	7
1. S. 5066, Jan. 24, 1919 (Mr. Chamberlain), 65th Cong	7
2. H.R. 13450, Dec. 19, 1918 (Mr. Charles B. Smith), 65th Cong	8
3. H.R. 12192, Jan. 31, 1920 (Mr. Kahn), 66th Cong	8
4. H.R. 3267, Dec. 10, 1924 (Mr. Lampert), 68th Cong	8
5. H.R. 11403, Feb. 26, 1925 (Mr. Lampert), 68th Cong	8
C. Public Law 325 (70th Cong.), Apr. 30, 1928	9
IV. Special acts	10
A. Background	10
B. Individual cases	10
1. John W. Stockett	10
2. D. M. Shearer	11
3. Solomon Van Meter	12
4. Capt. Russell Willson	12
5. Lt. John A. Dahlgren	12
6. Joseph Wynn Steel and William Peter Kruse	12
7. John J. Braund	13
8. William F. Friedman	13
9. Laurance F. Safford	13
V. Administrative regulations	13
VI. Awards for suggestions or inventions of Government employees	19
A. Background	19
B. Legislative enactments, 1946 to date	20
1. Public Law 600 (79th Cong.), Aug. 2, 1946	20
2. Public Law 429 (81st Cong.), Oct. 28, 1949	21
3. Public Law 763 (83d Cong.), Sept. 1, 1954	22
C. Other bills	23
1. S. 2665 and S. 3507 (Mr. Carlson), 83d Cong	23
2. H.R. 7774 (Mr. Hagen), 83d Cong	23

Part two. Inventions made by nongovernment employees or by Government financed research: Page

I. The establishment of an Inventions Awards Board 24
A. Background 24
B. Bills introduced 24
1. H.R. 7316, Mar. 31, 1952 (Mr. Celler), 82d Cong 24
a. Provisions 24
b. Hearings and significant testimony 24
c. Action taken 27
2. H.R. 639, Jan. 5, 1955 (Mr. Celler); H.R. 2383, Jan. 17, 1955 (Mr. Crumpacker); and S. 2157, Jan. 9, 1956 (Mr. Capehart)—84th Cong 27
a. Provisions 27
b. Hearings and significant testimony on H.R. 639 and H.R. 2383, House of Representatives 28
c. Action taken on H.R. 2383, House of Representatives 31
d. Hearings and significant testimony on H.R. 2383 and S. 2157, Senate 31
3. H.R. 103, Jan. 3, 1957 (Mr. Celler), 85th Cong 33
a. Provisions 33
b. Action taken on H.R. 103 33
4. Other bills 34
II. National Science Foundation 34
A. Background 34
B. Synposis of the legislation 35
C. 79th Congress 35
1. Important bills introduced—Senate 35
a. S. 1285, July 19, 1945 (Mr. Magnuson) 35
b. S. 1297, July 23, 1945 (Messrs. Kilgore, Johnson, and Pepper) 36
c. Working draft of S. 1297 (amendment in the nature of a substitute) 37
d. S. 1850, Feb. 27, 1946 (Messrs. Kilgore, Magnuson, et al.)—reported out of committee 37
e. Comparison of foregoing bills 37
f. Related bills 38
2. Hearings and significant testimony—Senate 38
a. In general 38
b. Specific witnesses 39
3. Action taken—Senate 45
a. Majority report on S. 1850 45
b. Minority report 46
c. Debates and action in Senate 48
4. H.R. 6448, May 15, 1946 (Mr. Mills) 48
a. Provisions 48
b. Hearings and significant testimony 49
c. Action 51
D. 80th Congress, 1st session 51
1. Important bills introduced—House of Representatives 51
a. H.R. 942, Jan. 14, 1947 (Mr. Celler) 51
b. H.R. 1815, Feb. 10, 1947 (Mr. Case) 51
c. H.R. 1830, Feb. 10, 1947 (Mr. Mills); H.R. 1834, Feb. 10, 1947 (Mr. Priest); H.R. 2027, Feb. 18, 1947 (Mr. Hays) 51
d. H.R. 4102, July 8, 1947 (Mr. Wolverton) 51
2. Hearings and significant testimony—House of Representatives 52
a. Specific witnesses 52
3. Action taken—House of Representatives 58
a. Reports 58
b. Debates in Congress 59

Part two. Inventions made by nongovernment employees—Continued
II. National Science Foundation—Continued
D. 80th Congress, 1st session—Continued Page
4. Important bills introduced—Senate 59
a. S. 525, February 7, 1947 (Mr. Thomas) 59
b. S. 526, February 7, 1947 (Messrs. Smith, Cordon, et al.) 59
c. Reports 60
d. S. 526—Debates in Congress and conference report 60
e. Presidential veto of S. 526 62
E. 80th Congress, 2d session (1948) 62
1. Important bills introduced 62
a. H.R. 6007, March 25, 1948 (Mr. Wolverton) 62
b. S. 2385, March 25, 1948 (Messrs. Smith, Cordon, et al.) 63
c. Other bills (H.R. 6238 and H.R. 4852) 63
2. Hearings and significant testimony 63
a. Specific witnesses 63
3. Reports 64
a. House Report 2223 64
b. Senate Report 1151 65
4. Debates in Congress 65
F. 81st Congress (1949–50) 65
1. Bills introduced 65
a. S. 247, January 6, 1949 (Messrs. Thomas (Utah), Kilgore, et al.) 65
b. H.R. 359, January 3, 1949 (Mr. Celler) 65
c. H.R. 12, January 3, 1949 (Mr. Priest); H.R. 185, January 3, 1949 (Mr. Harris); H.R. 311, January 3, 1949 (Mr. Wolverton); and H.R. 2751, February 15, 1949 (Mr. Biemiller) 65
d. H.R. 1845, January 25, 1949 (Mr. Van Zandt) and H.R. 2308, February 3, 1949 (Mr. Mills) 66
2. Hearings and significant testimony 66
3. Reports 66
4. Action in Congress and Presidential approval 66
G. Provisions of Public Law 507 (May 10, 1950) 66
H. 83d Congress (1953–54) 67
1. Bills introduced (S. 977 and H.R. 4689) 67
2. Provisions of Public Law 223 (Aug. 8, 1953) 68
I. 84th Congress (1955–56) 68
1. Bills introduced (H.R. 11200) 68
J. 85th Congress (1957–58) 68
1. Bills introduced (S. 1021, S. 1242, S. 3119, S. 3268, H.R. 2450, H.R. 7431, H.R. 9246, H.R. 10180, H.R. 11950, H.R. 11985) 68
III. Office of Technical Services 70
A. Background 70
B. Bills introduced and considered, 1945–47 70
1. S. 1248, July 9, 1945 (Mr. Fulbright), 79th Cong 70
a. Provisions 70
b. Hearings and significant testimony 71
c. Report and amendments 75
d. Debates in Congress 76
2. S. 493, Feb. 5, 1947 (Messrs. Fulbright and Aiken), 80th Cong 77
a. Provisions 77
b. Hearings and significant testimony 78
c. Report and amendments 82
d. Debates in Congress 83

Part two. Inventions made by nongovernment employees—Continued
III. Office of Technical Services—Continued
B. Bills introduced and considered—Continued
3. S. 868, Feb. 8, 1949 (Mr. Johnson of Colorado), 81st Cong — Page 83
a. Provisions — 83
b. Action—Senate — 83
c. Action—House — 84
4. Public Law 776 (81st Cong.), Sept. 9, 1950 — 84
IV. National Inventors Council — 84
V. Smithsonian Institution — 85
A. Background — 85
B. Bills proposing establishment of the Smithsonian Institution (1839–45) — 86
1. S. 292, reported Feb. 18, 1839 (Mr. Robbins); H.R. 1161, reported Feb. 16, 1839 (Mr. John Quincy Adams), 25th Cong — 86
2. S. 293, reported Feb. 18, 1839 (Mr. Robbins); H.R. 1160, reported Feb. 16, 1839 (Mr. Adams), 25th Cong — 86
3. H.R. 1, Mar. 5, 1840 (Mr. Adams), 26th Cong — 87
4. H.R. 386, reported Apr. 12, 1842 (Mr. Adams), 27th Cong — 87
5. S. 245, Feb. 11, 1841 (Mr. Linn), 26th Cong — 87
6. S. 259, reported Feb. 17, 1841 (Mr. Preston), 26th Cong.; S. 224, reported Apr. 11, 1842 (Mr. Preston), 27th Cong — 87, 88
7. S. 188, reported June 7, 1844 (Mr. Tappan), 28th Cong — 88
8. S. 18, Dec. 12, 1844 (Mr. Tappan), 28th Cong — 88
C. Act of Aug. 10, 1846 — 88
1. H.R. 5, Dec. 19, 1845 (Mr. Owen), 29th Cong — 88
2. Reports and action in Congress — 89
3. Provisions of the act — 89
D. Development of the Smithsonian Institution — 90
1. Changes in structure — 90
2. Growth — 90
a. General expansion — 91
b. National Zoological Park — 91
c. National Gallery of Art — 91
d. Smithsonian Gallery of Art — 92
e. Canal Zone Biological Area — 93
f. National Air Museum — 93
VI. National Academy of Sciences and National Research Council — 93
A. The National Academy of Sciences — 93
1. Establishment — 93
2. Legislative development — 94
3. Early activities — 94
B. The National Research Council — 95
1. Establishment — 95
2. Relationship to the National Academy of Sciences — 96
3. Organization — 97
4. Patent policy — 97
5. Activities of the Academy-Research Council — 98
VII. National Advisory Committee for Aeronautics — 99
A. Bills proposing research in aeronautics—prior to 1915 — 99
B. Bills proposing an advisory committee for aeronautics (63d Cong.) — 100
1. Senate Joint Resolution 229, January 26, 1915 (Mr. Tillman); Senate Joint Resolution 235, January 26, 1915 (Mr. Tillman); House Joint Resolution 413, February 1, 1915 (Mr. Roberts) — 100
a. Provisions — 100
b. Action taken — 101

Part two. Inventions made by nongovernment employees—Continued
VII. National Advisory Committee for Aeronautics—Continued
B. Bills proposing an advisory committee—Continued
2. Act of March 4, 1915, creating the National Advisory Committee for Aeronautics — Page 102
a. H.R. 20975, reported January 16, 1915 (Mr. Padgett) — 102
b. Action taken on H.R. 20975, and enactment thereof — 102
C. Development of the National Advisory Committee for Aeronautics — 103
1. Organization and duties — 103
2. Patent policy — 104
3. History and achievements — 105
VIII. National Aeronautics and Space Administration — 106
A. Background — 106
B. Bills introduced and considered—House of Representatives — 108
1. H.R. 11881, April 14, 1958 (Mr. McCormack), and companion bills, 85th Cong — 108
a. Provisions — 108
b. Hearings and significant testimony — 109
c. Action taken — 122
d. Debates in House — 126
C. Bills introduced and considered—Senate — 126
1. S. 3609, April 14, 1958 (Messrs. Johnson of Texas and Bridges), 85th Cong — 126
a. Provisions — 126
b. Hearings and significant testimony — 126
c. Action taken — 130
d. Debates in Senate — 130
D. Conference report and Public Law 568 — 131
IX. Small business and research and development — 136
A. Background — 136
B. Bills and Resolutions concerned with research and development—85th Congress — 137
1. Bills and Resolutions introduced — 137
a. House Resolution 166, February 14, 1957 (Mr. Thompson of New Jersey) — 137
b. H.R. 6645, April 4, 1957 (Mr. Hill) — 137
c. H.R. 7474, May 13, 1957 (Mr. Multer) — 138
d. S. Res. 138, May 20, 1957 (Mr. Sparkman and others) — 138
e. H.R. 7963, June 6, 1957 (Mr. Spence, reporting from committee) — 138
f. S. 2993, January 13, 1958 (Mr. Fulbright) — 138
g. S. 4033, June 19, 1958 (Mr. Javits) — 139
2. Hearings and action taken — 139
a. Hearings—House of Representatives — 139
b. Action taken, House of Representatives—H.R. 7963 — 140
c. Hearings—Senate — 140
d. Action taken, Senate—H.R. 7963 — 146
e. House Conference Report No. 2135 — 148
3. Public Law 536 (85th Cong.), July 18, 1958 — 148

Part three. Patent extensions:
I. Historical background — 151
II. General extensions not involving war conditions — 154
A. Proposals during the 1930's — 154
III. General extensions under war conditions — 154
A. World War I — 154
1. H.R. 13043, June 24, 1926 (Mr. Vestal), 69th Cong — 154

Part three. Patent extensions—Continued
III. General extensions under war conditions—Continued
Page
A. World War I—Continued
2. Public Law 623 (70th Cong.), May 31, 1928 154
a. H.R. 10435, February 2, 1928 (Mr. Vestal) 154
b. Hearings and significant testimony 155
c. Action and enactment of H.R. 10435 157
B. World War II 158
1. H.R. 1190, January 8, 1945 (Mr. O'Hara), 79th Cong 158
2. H.R. 6346, May 7, 1946 (Mr. Rich), 79th Cong 159
3. Other bills of the 79th Cong 160
4. Bills introduced in the 80th Cong., upon which hearings were held 160
a. Provisions 160
b. Hearings 161
c. Reports 162
5. H.R. 4304, July 21, 1947 (Mr. Lewis), 80th Cong 163
6. Other bills of the 80th Cong 163
7. Public Law 598 (81st Cong.), June 30, 1950 163
8. Other bills introduced in the 81st Cong 164
9. Public Law 437 (82d Cong.), June 1, 1952 164
C. Post-World War II and Korean conflict 164
1. Bills introduced in the 82d Cong., upon which hearings were held 164
a. Provisions 164
b. Hearings 165
2. Other bills introduced in the 82d Congress 167
3. Bills introduced in the 83d Cong., upon which hearings were held 167
a. Provisions 167
b. Hearings 167
c. Committee and other action 175
4. Bills introduced in the 84th Cong., upon which hearings were held 176
a. Provisions 176
b. Hearings 177
c. Committee and other action 177
IV. Individual extensions—special bills 182
A. Art Metal Works, Inc. (Private Law 554, December 23, 1944) 182
1. Background 182
2. H.R. 2994, June 17, 1943 (Mr. Hartley), 78th Cong 183
a. Hearings 183
b. Committee and other action 184
B. Elbert R. Robinson patents 184
1. Background 184
2. Bills introduced 184
a. Bills introduced in the 74th and 75th Congresses 184
b. H.R. 7685, September 25, 1939 (Mr. Reed), 76th Cong 185
c. H.R. 9341, April 10, 1940 (Mr. Maciejewski), 76th Cong 185
3. Hearings 185
4. Committee action 187

APPENDIXES

A. Rules and regulations relating to patentable inventions of employees of the National Advisory Committee for Aeronautics 188
B. National Aeronautics and Space Act of 1958—Provisions relating to patents, inventions and contributions awards 193
C. Special acts of Congress relating to extensions of patents 197

PUBLICATIONS OF THE SUBCOMMITTEE

Patent Studies

No. 1. Bush, Proposals for Improving the Patent System (1956).
No. 2. Frost, The Patent System and the Modern Economy (1956).
No. 3. Patent Office, Distribution of Patents Issued to Corporations, 1939–55 (1956).
No. 4. Federico, Opposition and Revocation Proceedings in Patent Cases (1957).
No. 5. Vernon, The International Patent System and Foreign Policy (1957).
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No. 12. LRS (Corry), Compulsory Licensing of Patents—A Legislative History (1958).
No. 13. LRS (Edwards), Patent Office Fees—A Legislative History (1958).
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No. 20. LRS (Conway), Single Court of Patent Appeals—A Legislative History (1958).
No. 21. OTS (Green), Technical Research Activities of Cooperative Associations (1958).
No. 22. LRS (Jibrin and Corry), Government Assistance to Invention and Research—A Legislative History (1959).

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Tennessee Valley Authority (1959).
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Veterans' Administration (1959).

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Report, Patents, Trademarks, and Copyrights (S. Rept. 1430, 85th, 2d, 1958).
Report, Patents, Trademarks, and Copyrights (S. Rept. 97, 86th, 1st, 1959).

GOVERNMENT ASSISTANCE TO INVENTION AND RESEARCH—A LEGISLATIVE HISTORY

By Barbara H. Jibrin and Catherine S. Corry (Legislative Reference Service)

INTRODUCTION

The history of the United States, beyond that of any other country, has been a history of the application of new techniques and inventions by its citizens. The pioneering spirit of Americans, especially on the industrial front, has allowed us to achieve in less than two centuries what took hundreds and thousands of years to accomplish in other countries.

It is as true today, as it was in the very beginnings of mankind, that our fate—indeed, our very survival—depends upon the creative talents of our scientists and inventors. So it is a timely moment in history to review how we have been treating the inventor, and to look back at the attempts of the Federal Government to protect and encourage this valuable resource.

The Founding Fathers recognized the importance of rewarding the inventor, and provided in article I, section 8 of the Constitution that Congress shall have the power "To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." It is the object of this report to review some of the important legislation designed "to promote the progress of science."

Part 1 covers the attempts by the Government to stimulate invention, or suggestions, among its employees. The present-day benefits are the result of over 100 years of court decisions and legislative action to insure the inventor his rights and to provide incentives for creative work. The efforts and contributions of Government employees and the ways developed to stimulate, reward, and protect these efforts, are part of the overall picture.

Part 2 sketches the legislative history back of some of the Government agencies engaged in research and how they deal with patents and other inventions. It also deals with proposals involving inventions made in the course of Government-financed research. The National Science Foundation is treated in especial detail, both because of its broad range of activities and wide influence, and because of the fact that the hearings and debates on its formation are replete with testimony on the need for, merits of, and risks involved in Federal assistance to science.

The research carried on in various other Government agencies, not primarily created for these purposes, such as the Departments of Agriculture, Commerce, and Defense, falls outside the scope of this report. The extensive research of the Atomic Energy Commission has also been omitted.

Part 3 covers legislative proposals for extending the life of patents, whether generally, to certain groups, or on behalf of specific individuals.

This report is essentially a legislative history based on congressional hearings, reports, and debates.

PART 1. INVENTIONS MADE BY GOVERNMENT EMPLOYEES

The Government, like private industry, has the right to establish policies with its employees, whether the policy concerns disposition of patent rights in employees' inventions or the giving of special awards for meritorious suggestions and ideas.

The respective rights of the Government and its employees in regard to inventions may range from complete ownership by the Government to complete ownership by the employee. In the Law Monograph of the 1947 report of the Attorney General concerning Government patent practices and policies,[1] the following sources of these rights are listed: (1) the common-law rights of employer and employee; (2) a statute such as the 1910 act as amended; (3) a contract with the employee; and (4) administrative regulations. To this list may be added (5) awards to Government employees for inventions or suggestions.

I. COMMON LAW RIGHTS

In the case of *Solomons* v. *United States*,[2] the Supreme Court held that an employee might exercise his inventive faculties with assurance that his invention was his own individual property, with the limitation that if he were expressly employed to devise or perfect an instrument, he could not, after accomplishing the work, plead title against his employer. In the case of *Houghton* v. *United States*,[3] it was held that where the Government employs an inventor to invent a particular device, it has a right to the exclusive ownership of the patent, and may compel an assignment when issued.

In the case of *United States* v. *Dublilier Condenser Corp.*,[4] the Supreme Court held that the Government was not entitled to an assignment of patents because the inventors had not agreed to exercise their inventive faculties in their work and their inventive activities were not within the scope of employment. They had not been "employed to invent," even though the work was conducted in Government laboratories, with Government money, and while drawing Government salaries. Justice Stone dissented, holding that the patents should be assigned to the United States. The Supreme Court did hold, however, that the servant who perfects an invention with "his master's materials and appliances" must accord his master a nonexclusive right to practice the invention.

[1] U.S. Department of Justice, Investigation of Government Patent Practices and Policies: Report and Recommendations of the Attorney General to the President, vol. III, p. 134 (1947).
[2] 137 U.S. 342 (1890).
[3] 23 F. 2d 386 (4th Cir. 1928), cert. denied, 277 U.S. 592 (1928).
[4] 289 U.S. 178 (1933).

II. THE ACT OF 1910 AND THE 1952 AMENDMENT THERETO

A. EARLY HISTORY

Prior to the act of June 25, 1910,[5] a patentee, including Federal employees, seeking to recover compensation from the United States for the unlicensed use of his invention had to establish an express or implied contract by the Government to pay for such use.[6] In the absence of such contract, the patent owner as a rule had no remedy against the United States, unless Congress, by special act, gave him access to the courts.[7]

The act of June 25, 1910, attempted to remedy the situation for non-Government employees. The Government employee, however, was barred from receiving the benefits of this act. The act read:

> * * * whenever an invention described in and covered by a patent of the United States shall hereafter be used by the United States without license of the owner thereof or lawful right to use the same, such owner may recover reasonable compensation for such use by suit in the Court of Claims: *Provided, however,* That said Court of Claims shall not entertain a suit or reward compensation under the provisions of this act where the claim for compensation is based on the use by the United States of any article heretofore owned, leased, used by, or in the possession of the United States: *Provided further,* That in any such suit the United States may avail itself of any and all defenses * * * set forth in title 60 of the Revised Statutes: *And provided further, That the benefits of this Act shall not inure to any patentee, who, when he makes such claim is in the employment or service of the Government of the United States; or the assignee of any such patentee; nor shall this Act apply to any device discovered or invented by any such employee during the time of his employment or service.* [Emphasis added.]

An examination of the debates in Congress reveals arguments for and against including Government employees:[8]

> Mr. GOLDFOGLE. The amendment will shut out cases of employees who, availing themselves of experience gathered in the departments, have invented devices and then permitted the Government to use them, and therefore claim compensation from the Government.
>
> But, if the amendment be adopted, there will be still open a remedy to such employees. They still can come, as they now can come, before Congress, and lay their claims before us here. The amendment does not preclude them from such remedy, but the amendment does cut them out from availing themselves of the provisions of the bill. The amendment will prevent them suing the Government in the courts, and securing awards in cases where they ought not be awarded anything. They have ample opportunity of securing relief, if in fact they should have any. But they ought not, I

[5] 36 Stat. 851 (1910), 28 U.S.C. sec. 1498 (1952).
[6] See, e.g., *United States* v. *Burns*, 12 Wall. 246 (1870).
[7] See, e.g., *Schillinger* v. *United States*, 155 U.S. 163 (1894).
[8] 45 Congressional Record, p. 8785.

> repeat, to be permitted to sue the Government in the courts in the cases referred to in my amendment.
>
> Mr. CURRIER. I do not believe that in the end it will be for the benefit of the U.S. Government to say to all the distinguished men who happen to be in its employ, all the great scientists, and all the bright inventors, that they shall have no reward for their studies or for their talent in inventing things which can be used, perhaps by the Government only: * * *.

Another important argument against including Government employees was that the inventor might use his official position to influence the Government to use his invention.

In 1918, the Supreme Court held that the 1910 act did not apply to infringement of a patent by a private contractor performing a Government contract and therefore did not protect the contractor against a suit for injunction and an accounting.[9] This decision resulted in an amendment on July 1, 1918, making the 1910 act applicable to use or manufacture of a patented invention "for" the United States (e.g., by a contractor) as well as "by" the United States (e.g., by an employee).[10]

However, the Government employee was still in the same position of being unable to receive the benefits from this act, and this condition continued until 1952 when it was alleviated by the legislation discussed below.

B. PUBLIC LAW 582 (82D CONGRESS), JULY 7, 1952

1. LEGISLATIVE HISTORY

Public Law 582 [11] had its origin in H.R. 3975, introduced by Mr. Rodino on May 4, 1951. It provided that the act of 1910 be amended to permit Government employees to maintain patent suits against the United States. The bill was reported out favorably by the House and Senate Committees on the Judiciary (H. Rept. 1726 and S. Rept. 1992), passed both Houses, and became law on July 7, 1952.

2. IMPORTANT PROVISIONS

The bill, as passed, elminated the sentences prohibiting Government employees from suing and substituted therefor, the following:

> A Government employee shall have the right to bring suit against the Government under this section except where he was in a position to order, influence, or induce use of the invention by the Government. This section shall not confer a right of action on any patentee or any assignee of such patentee with respect to any invention discovered or invented by a person while in the employment or service of the United States, where the invention was related to the official functions of the employee, in cases in which such functions included research and development, or in the mak-

[9] *Cramp & Sons* v. *Curtis Marine Turbine Co.*, 246 U.S. 28 (1918).
[10] 40 Stat. 705 (1918), 34 U.S.C. sec. 521 (1952).
[11] 66 Stat. 757 (1952), 28 U.S.C. sec. 1498 (1952).

ing of which Government time, materials, or facilities were used.

3. SIGNIFICANT TESTIMONY AND COMMENTS

The House committee, in its statement, explained the exclusion of Federal employees from the benefits of the earlier act as follows:

> Section 1498 of title 28 was written into the act of June 25, 1910, in order to provide a safeguard against the possibility of a patentee in the Government service utilizing his official position to influence the use of his invention by or for the Government and then maintaining a claim for compensation for such use, and also to prevent a Government employee who made an invention in the course of his official duties from maintaining a claim for the use of the invention by the Government.

The hearings that were held by the House were not printed; however, Mr. Paul A. Rose, whose testimony was printed in the report, said:

> Obviously, it was inequitable and unnecessary to prevent all Government employees from maintaining a suit against the United States in order to erect safeguards against those few who might be in a position to benefit unjustly from use of their inventions by the Government. For instance, if a person made an invention in private life relating to armaments and later entered Government service, say in the Post Office, there is no valid reason why he should not maintain a suit against the United States if the Army or the Navy ordered the manufacture or use of a device which infringed his patent. The same would apply if he made the invention after entering Government service so long as it did not relate directly to his official duties.

III. THE ACT OF 1883 AND THE 1928 AMENDMENT THERETO

A. EARLY HISTORY

Since 1883 a Federal employee has had the right to obtain a patent on his inventions, without fee, if he were willing to grant the Government a free license thereunder. Until 1928, however, there was some question as to whether an invention so patented was not also open to free public use.

The act of March 3, 1883,[12] provided:

> The Secretary of the Interior and the Commissioner of Patents are authorized to grant any officer of the Government, except officers and employees of the Patent Office, a patent for any invention of the classes mentioned in [Rev. Stat., sec. 4886] * * * when such invention is used or to be used in the public service, without the payment of any fee: *Provided,* That the applicant in his application shall state that the invention described therein, if patented, may be used by the Government or any of its officers or employees in the prosecution of work for the Government, *or by any other*

[12] 22 Stat. 625 (1883), 40 U.S.C. sec. 143 (1952).

> *person in the United States*, without the payment to him of any royalty thereon, which stipulation shall be included in the patent. [Emphasis added.]

The first court test of whether a patent issued under the act would be open to the public came in the case of *Squier* v. *American Telephone & Telegraph Co.*[13] In 1910, Major Squier, acting on the advice of the Judge Advocate General, applied for a patent on his invention (a wireless apparatus which simultaneously transmitted several messages over a single telephone wire), under the act of 1883. In accordance with the current views of the Judge Advocate General concerning his legal rights, Squier made public announcements of his intention to dedicate his invention to the public. However, on November 30, 1918, the Acting Judge Advocate General of the Army reversed the previous ruling that patents issued under that act required public dedication, and held that the 1883 act provided for free use for governmental purposes but not by the general public.[14] The same interpretation was given by Acting Attorney General Ames on March 22, 1920.[15] He said that the invention could be used free of royalty only if the use be in the prosecution of work for the Federal Government. This change of position led Major Squier to bring a suit against the American Telephone & Telegraph Co. for infringement of the patent he had obtained under the 1883 act. The district court, declining to follow the Acting Attorney General's opinion, held that a patent issued under the 1883 act was open to free public use and the other district courts agreed with this view.[16]

The War Department, in 1919, had already begun to sponsor or support a number of bills to amend the act of 1883 to make it clear that the inventor would not lose his commercial rights by filing thereunder. The resulting activity in Congress is described in the following section.

B. BILLS INTRODUCED AND CONSIDERED, 1919–25

1. S. 5066, JANUARY 24, 1919 (MR. CHAMBERLAIN)—65TH CONGRESS

S. 5066 provided for amending the act of 1883 to state expressly that the free license thereunder should extend only to the Government and not to "any other person in the United States." Hearings were held before the Senate Committee on Patents in January 1919.

Maj. A. M. Holcombe, speaking for the War Department, testified that it was the policy of that Department to leave commercial rights in the inventor and that the change in the 1883 act was sought to permit continuance of that policy while making use of the machinery of the act.

Senator Colt, also supporting the bill, commented as follows:

> Now if the inventor is to obtain no reward, if his invention is to be dedicated to the public, you take the heart right out of the whole patent system. I think the objection to this

[13] 21 F. 2d 747 (S.D.N.Y. 1924); 7 F. 2d 831 (2d Cir. 1925).
[14] 2 Ops. J.A.G., p. 1029 (1918).
[15] 32 Ops. Atty. Gen., pp. 145, 146 (1920).
[16] *Squier* v. *American Tel. & Tel. Co.*, 21 F. 2d 747 (S.D.N.Y. 1924). The district court also held that Major Squier, by permitting the War Department to announce, with his approval, that the use of the invention was free to the public, had thereby so dedicated it. The Circuit Court of Appeals affirmed on the latter ground. *Squier* v. *American Tel. & Tel. Co.*, 7 F. 2d 831 (2d Cir. 1925).

bill—I think what you said about the War Department is extremely just and equitable, and I think if this bill is framed upon the principle that the Trade Commission should take up the question of these patents, that the inventor should not be charged anything; then as a return for that, that the Government should have an exclusive license to these inventions. I do not like the idea, because I know that the pressure of manufacturers and of the Government is that every invention that is made while the inventor is in the employment of the Government or in the employment of the manufacturer belongs to the Government or the employer, and the aspect of this bill that I do not like, while it is voluntary, is that inventors have got an idea that while they are employed by the Government the Government will not grant them any patent or will not grant them any compensation for that patent.

The bill was reported out favorably by the Senate Committee on Patents (S. Rept. 661), but no further action was taken.

2. H.R. 13450, DECEMBER 19, 1918 (MR. CHARLES B. SMITH)—65TH CONGRESS

H.R. 13450 was identical to S. 5066. Hearings were held by the House Committee on Patents. Again, Major Holcombe testified in favor of granting the commercial rights under their inventions to Federal employees obtaining patents under the 1883 act. No action was taken on the bill.

3. H.R. 12192, JANUARY 31, 1920 (MR. KAHN)—66TH CONGRESS

Proposed amendment to the act of 1883 so that inventors applying for a patent thereunder would not have to give a license to the public. No action was taken.

4. H.R. 3267, DECEMBER 10, 1924 (MR. LAMPERT)—68TH CONGRESS

Provided for amendment to the act of 1883 so as not to require giving a free license to other than the Federal Government. For hearings, see H.R. 11403, infra. No further action was taken.

5. H.R. 11403, FEBRUARY 26, 1925 (MR. LAMPERT)—68TH CONGRESS

Provisions similar to H.R. 3267. Hearings were held by the House Committee on Patents on both H.R. 3267, supra, and H.R. 11403.

Colonel McMullen, Department of Judge Advocate General, and chief, central patent section, War Department, testified as follows in response to questions by Congressman Lanham:

> Mr. LANHAM. As I understand it, the necessity for this bill arises from this fact: That inventions are made by men in these respective services; that patents are not taken out on them, and that subsequently patents are taken out on them by people not in the service.
>
> Colonel MCMULLEN. Exactly.

Mr. LANHAM. And then, when the necessity arises for the Government to use those inventions, the Government makes itself liable to suits for infringement by people outside of the service on inventions which were made by people in the service.

Colonel MCMULLEN. Exactly.

Colonel McMullen also submitted a memorandum to the committee in which he stated:

> During the more than 40 years of the life of the act of 1883, comparatively few patents have been taken out by employees under that act, the impression throughout the service generally being that it gave the individual no protection to his rights and that the Government did not need it. As a consequence the Government has not received the patent protection which it undoubtedly otherwise would have received if the act had been in such form as to hold out some encouragement to service employees.

William N. Roach, chief, patent section, Ordnance Department, submitted a memorandum to the committee, in which he said:

> The act of March 3, 1883, under which the Ordnance is compelled to operate, provides a very poor basis for such operation:
>
> First, because the act is so indefinite and uncertain in its terms and that very few persons will agree as to its meaning.
>
> Second, because there are many instances where devices containing structure which may prove of great worth to the Government may not be patented under the act even though invented by Government employees.
>
> Third, because the act is such that it furnishes no incentive for the Government employee to disclose his ideas and patent them.

The House committee reported out H.R. 11403 favorably (H. Rept. 1596). Mr. Lanham, in submitting the report, said:

> The Committee on Patents held hearings on the provisions of this measure, and it developed in the testimony that the passage of this bill would likely result in the saving to the Government of a very considerable sum of money. The testimony shows that many useful inventions have been made by employees in various branches of the Government service which have not been protected by patents. Subsequent inventions by people outside of the Government service upon which patents have been procured have led to many suits for infringement, which have been costly to the Government.

No further action was taken on the bill.

C. PUBLIC LAW 325 (70TH CONGRESS), APRIL 30, 1928

Public Law 325 [17] had its origin in H.R. 6103, introduced by Mr. Vestal, December 7, 1927. It provided for amending the act of 1883

[17] Act of Apr. 30, 1928, ch. 460, 45 Stat. 467 (1928), 35 U.S.C. sec. 45 (repealed 1952).

by eliminating the words "every other person" in the provisions for free licensing. Hearings were held by the House Committee on Patents.

Again, *Colonel McMullen* testified in favor of the amendment. He said:

> The purpose of the act of 1883 is to permit the issuance of patents without legal fee to officers and employees of the Government. Prior to the World War there was very little attention paid to patents in the Government service, and, as the result, when the war was over we were confronted with suits amounting to over a billion dollars on patents, and we have about $600 million still pending in the Court of Claims, and when we investigated the matter we found that a great many of those suits grew out of a situation where inventions had really been made in the Government service, but no patent applied for on the invention by the Government employee. For instance, we would find a patent come out, being "a Chinese copy" of one of our aerial drop bombs, would get hold of the drawing and make application for patent, and this act of 1883 has never applied to either officers or employees and given them any protection.

The House and Senate reported favorably on H.R. 6103 (H. Rept. 871 and S. Rept. 765). The bill was debated in Congress,[18] and finally became law on April 30, 1928. As amended, the 1883 statute now provides that the applicant shall state in his application—

> that the invention described therein, if patented, may be manufactured and used by or for the Government for governmental purposes without the payment to him of any royalty thereon.

IV. SPECIAL ACTS

A. BACKGROUND

Congress, under its general power of appropriation (U.S. Constitution, art. I, sec. 8, cl. 1, and sec. 9, cl. 7) and under its power to create and define the jurisdiction of the lower Federal courts (U.S. Constitution, art. II, sec. 1), is empowered to enact special acts which (1) authorize an outright payment for the use of an invention made by by a Federal employee or (2) remit the question of compensation to the courts for judicial determination on the basis of common law principles or other standards of liability. It has exercised this power in a number of cases, as described below.

B. INDIVIDUAL CASES

1. JOHN W. STOCKETT

During the period from 1898 to 1902, Stockett, a draftsman in the Ordnance Department, obtained patents for improvements in breech mechanisms for guns. At his own initiative, but with the approval of his superiors, he perfected the construction of the gun. On December 3, 1907, the Acting Secretary of War addressed a communi-

[18] 69 Congressional Record, p. 7066.

cation to the Speaker of the House of Representatives recommending legislation by Congress authorizing the Secretary of the Treasury to pay plaintiff $20,000 "as payment in full for his patents covering features of breech and firing mechanisms for breechloading ordnance which are now in use on guns owned by the U.S. Government." A bill (S. 2670, 60th Cong.) was introduced calling for an appropriation of this amount, but it was not passed. On December 21, 1909, the Acting Secretary of War addressed another communication renewing his previous recommendation of a $20,000 appropriation "in full payment for all past and future use of the patents, or any improvements thereon that may be patented, and for all royalties whatsoever." On January 18, 1910, another bill (H.R. 18628, 61st Cong.) was introduced. This bill was reported favorably by the Committee on Claims of the House, but on April 8, 1910, was referred to the Committee of the Whole House, which rejected it. Stockett testified before the House Committee on Claims on March 3, 1910, that he would consider $20,000 "a fair, square compensation." In 1911, S. 10838 (61st Cong.) was introduced in the Senate, directing payment of $142,500 to Stockett. The matter was referred to the Court of Claims. That court, in 1926, concluded that "whether the plaintiff should receive any compensation is a matter that rests in the discretion of Congress." The following statement in the court's findings bears on the merits of the issue:

> This device, while it involved a knowledge of existing inventions, and was in the line of evolution, was plaintiff's own work and not required of him as part of his duties, but was voluntary on his part.[19]

In 1928, a bill (S. 2319, 70th Cong.) was introduced in the Senate providing for payment of $142,500 to Stockett, but it received no action. In 1929, however, the War Department Appropriations Act passed by Congress included $50,000 for payment of Stockett's claims.[20]

2. D. M. SHEARER

During the period 1915–17, Shearer, an engineer attached to the Mississippi River Commission, made inventions relating to concrete revetments. On December 17, 1930, Shearer's claim against the United States for compensation for the use of his inventions was referred to the Court of Claims by Private Act No. 285 (71st Cong.). In 1938, the Court of Claims held that Shearer was entitled to compensation as to one patent on the ground that he was not on duty status when he conceived the invention covered thereby. With respect to a second patent covering an invention made while on active duty, the court held that the Government had an implied license.[21] The case was remanded and referred to a Commissioner to take testimony on the question of compensation for the Government's use of the first patent. In 1944, Shearer was awarded approximately $320,000.[22]

[19] S. Doc. 134, 69th Cong., 1st sess. (1925-26). The statement also appears in S. Rept. 537, 70th Cong., 1st sess. (1927–28).
[20] 45 Stat. 1349, 1381 (1929), 48 U.S.C. sec. 35 (1952).
[21] *Shearer* v. *United States*, 87 C.C.P.A. (Patents) 40 (1938).
[22] *Shearer* v. *United States*, 101 C.C.P.A. (Patents) 196 (1944).

3. SOLOMON VAN METER

In 1916, Van Meter, while a civilian not in Government employ, secured a patent for a parachute apparatus. He subsequently became an officer in the Army, and therefore was subject to the 1910 act which barred him from suing the Government for infringement. This disability was waived by the passage of a special act (Private Act 271, 68th Cong.). He brought suit and recovered $46,000. The decision of the district court was affirmed on appeal and claimant was held entitled not only to a reasonable royalty, but also to the profits resulting from the manufacture of his device.[23]

4. CAPT. RUSSELL WILLSON

Captain Willson while at sea in 1916 conceived an invention in connection with the secret communication facilities of the Navy. The invention was used by the Navy beginning in 1917, but for reasons of public policy was never patented. In 1935, the Navy Department recommended, and Congress enacted, legislation to pay the inventor $15,000 in full settlement for the use of his invention (Private Law 79, act of June 13, 1935, 49 Stat. 2077).

5. LT. JOHN A. DAHLGREN

Lieutenant (later Admiral) Dahlgren invented certain improved naval guns in the line of duty by means of experiments conducted at the expense of the United States. Dahlgren's widow filed a claim for compensation for the use of the inventions by the Navy Department and Congress passed a special act dated June 19, 1878,[24] referring the claim to the Court of Claims. Although that court found that the circumstances under which the inventions were made would at least have entitled the Government to "a complete defense" to the suit, it construed the special act as authorizing recovery notwithstanding such defenses if the patents were found valid, deeming the defenses to be pertinent only to the amount to be awarded. It awarded $65,000, the maximum permitted by the special act, and the patents were assigned to the United States as required by the act.

6. JOSEPH WYNN STEEL AND WILLIAM PETER KRUSE

H.R. 3220 was introduced in the 82d Congress for the relief of Steel and Kruse. It was reported out by the Committees on the Judiciary (H. Rept. 1815 and S. Rept. 1698), passed Congress, and became Private Law 770 (66 Stat. A120) on July 1, 1952. The act authorized payment of $10,000 each to Steel and Kruse for settlement of their claims against the United States for compensation covering their invention of a conversion unit for standard coin presses and its use by the United States—an invention calculated to save the Government several million dollars. They conceived this invention while working with the Bureau of the Mint.

[23] *Van Meter* v. *United States*, 47 F. 2d 192 (2d Cir. 1931).
[24] Act of June 13, 1935, ch. 237, 49 Stat. 2077.

7. JOHN J. BRAUND

H.R. 4549 was introduced in the 84th Congress for the relief of Braund. It was reported out by the Committees on the Judiciary (H. Rept. 264 and S. Rept. 611), passed Congress, and became Private Law 126 (69 Stat. A56), July 7, 1955. The act authorized the payment of $15,000 for settlement of claims against the United States.

8. WILLIAM F. FRIEDMAN

H.R. 2068 was introduced in the 84th Congress for the relief of Friedman. It was reported out by the Committees on the Judiciary (H. Rept. 260 and S. Rept. 1815), passed Congress, and became Private Law 625 (70 Stat. 264), May 10, 1956. The act authorized payment of $100,000 for settlement of rights in respect of his inventions relating to military, naval, and air communications facilities which had been placed in secrecy status by the War Department or the Department of Defense.

9. LAURANCE F. SAFFORD

S. 1524 was introduced in the 85th Congress for the relief of Safford. It was reported out by the Committees on the Judiciary (H. Rept. 1896 and S. Rept. 1473), passed Congress, and became Private Law 494, July 22, 1958. The act authorized payment of $100,000 for settlement of claims against the United States in connection with cryptographic systems and apparatus invented and developed by Safford while serving on active duty in the U.S. Navy and which have been held in secrecy status by the U.S. Government.

V. ADMINISTRATIVE REGULATIONS

One of the first agencies to effect patent regulations was the Department of Agriculture. In a general order of May 8, 1905, the Secretary required employees making useful discoveries or inventions in connection with the work of the Department, and while utilizing Government time and Government money, to apply for patents under the terms of the act of 1883. In the report of the Secretary of Commerce and Labor in 1907,[25] the effect of the ruling was described as follows:

> This policy is in line with the decisions of the courts upon the doctrine that when an employee takes out a patent, the subject matter of which is in the general line of his employment, there is an implied license in the employer to use the patent. There is a marked distinction, however, between this doctrine and the practice in the Department of Agriculture, in that the ownership of the patent right in the former case remains in the inventor, who can regulate its use as he may see fit, subject to the employer's license, while the method required in the Department of Agriculture takes the entire property right from the patentee, leaving him nothing of monetary value.

[25] "Patents Granted to Officers and Employees of the Government," H. Doc. 914, 60th Cong., 1st sess., p. 8 (1907-08).

The second report of the National Patent Planning Commission,[26] after studying each Government agency, had the following to report on the general practices of the departments:

> A number of Government departments have issued regulations dealing with inventions of their employees. With minor exceptions these departments expect or require that inventions made within the specifically assigned duties of the employee shall be assigned to the Government, in conformity with the decisions of the courts regulating the matter in default of specific agreement. The departments generally assert no rights in inventions made by an employee on his own time, without the use of Government facilities, and in a field unrelated to his employment, except as may be voluntarily granted by the employee. In situations other than these two the general rule is that the invention and the patent belong to the employee in the absence of a specific agreement to the contrary, although the employer may have the right to use the invention without payment of a royalty. Some departments follow this general rule while others require assignment of the patent in cases where the invention is closely related to the duties of the employee and the work of the department.
>
> In general, when research is conducted primarily for the benefit of the public as a whole, Government agencies tend to permit retention of private commercial rights by the employee in a smaller proportion of cases than when the research is aimed at improvement of governmental functions and operations. In the latter cases the direct needs of the Government are completely met by its freedom to make and use any invention which may result, or to have the invention made and used for governmental purposes, without payment of royalties or any restrictions.

The Commission recommended that two principles, established by numerous court decisions, were so equitable, so firmly established in the common law, and relatively so susceptible to administrative adoption and enforcement, that they be made applicable throughout Government service. They are:

(*a*) Inventions made within the specifically designated duties of the employee shall be assigned to the employer, since he has only produced that which he was employed to invent.

(*b*) Inventions made by an employee on his own time, without the use of his employer's facilities, and in a field unrelated to his employment, shall be the exclusive property of the employee, who shall be entitled to all patent rights.

In the areas not covered by (*a*) and (*b*), the Commission felt it inadvisable to devise a uniform law, but proposed that each case be judged on its own facts, since a great deal of flexibility is necessary. However, the Commission recommended:

> * * * that policies and regulations adopted by any agency be submitted to a central control body for approval before they become effective, and that this body also serve as an

[26] "Owned Patents and Inventions of Government Employees and Contractors," H. Doc. 22, 79th Cong., 1st sess., p. 9 (1945).

appellate tribunal with power of final decision as regards appeals which employee-inventors may desire to take from agency decisions.[27]

Subsequent to the report of the National Patent Planning Commission, the next, and most comprehensive of all studies which dealt with this general subject was the investigation by the Department of Justice which covered a span of 3 years (1943–46). In 1947 the study culminated in a three-volume work called "Investigation of Government Patent Practices and Policies—Report and Recommendations of the Attorney General to the President." The recommendations of the Attorney General were as follows:

I. Patent aspects of Government research

The research and development activities of the Government have mirrored our national history, concentrating on military science in revolutionary times, expanding to meet the needs of agriculture, public health and other fields in the 19th century, and skyrocketing during the past 5 years into a multi-billion-dollar program concerned primarily with aviation, transportation, communications, ordnance and atomic energy. Federal participation in postwar research will be large and of major significance. The fruits of this great national resource are advances in science and technology, usually susceptible of civilian as well as governmental uses; and since many of these advances consist of patentable inventions, their use and enjoyment by the Government and by the people of the United States may depend upon the control of patent rights.

This study has sought the answer to the following inquiry: What disposition of patent rights as between the Government, its employee or contractor, and what use of patent rights owned by the Government, will best serve the public welfare and stimulate the progress of science and the useful arts?

II. Inventions made by Government employees

A. Findings and conclusions of Attorney General

Inventions financed with public funds should inure to the benefit of the public, and should not become a purely private monopoly under which the public may be charged for, or even denied, the use of technology which it has financed. The weight of informed opinion and the evidence of experience establish that the ownership of patent rights is not a necessary form of incentive to the great majority of Government scientists and technicians. Such opinion and experience further establish that patent rights are in fact an undesirable form of incentive because they may induce lack of cooperation and secretiveness among research workers; may unduly emphasize the patentable phases of their work; would provide an unequal form of reward for performance of com-

[27] Id. at p. 10.

parable merit and usefulness; and would permit public-financed technology to be suppressed, used restrictively, or made the basis of an exaction from the public to serve private interests.

B. Recommendations of Attorney General

1. The Government should obtain all rights to inventions made by its employees (i) during working hours, or (ii) with a substantial contribution by the Government (in the form of facilities, equipment, materials, funds or information, time paid for by the Government, or services of other Government personnel), or (iii) bearing a direct relation to the employee's official functions.

2. In other cases, where there is some contribution by the Government, or some relationship between the invention and the employee's official functions, but where these are clearly insufficient to warrant the assignment to the Government of all rights in the invention, as determined by the Government agency concerned, with the approval of the Government Patents Administrator (the head of the central agency which this report recommends be established to administer the Government's patent policy), ownership of the invention should be left to the employee, subject to a nonexclusive, irrevocable, royalty-free license to the Government to make, have made, use, and dispose of the invention, and also subject to the obligation on the part of the inventor or his assignee to exploit the invention diligently or to grant nonexclusive licenses thereunder at a reasonable royalty to all applicants.

3. In all other cases, the Federal employee should retain all rights to his inventions, subject to existing provisions of law. At the inventor's election, the Government may undertake to patent the invention free of any charge to the inventor under the act of 1883, as amended, subject to the governmental license provided for therein.[28]

On January 23, 1950, President Harry S. Truman signed Executive Order 10096 [29] to provide for a "a uniform patent policy for the Government with respect to inventions made by Government employees and for the administration of such policy." The policies and provisions contained in this Executive order had been recommended strongly by the 1947 report of the Attorney General.

Executive Order 10096 is administered by the Chairman of a Government Patents Board (GPB) established by the order. This Board consists of an independent chairman and a representative from each Cabinet department and executive agency (except the Atomic Energy Commission) which is substantially concerned with inventions made by Government employees. The terms of the order, briefly, are as follows:

[28] Vol. I, at pp. 2-3.
[29] 37 C.F.R. sec. 300 (Supp. 1956).

Paragraph 1 sets forth the substantive criteria for determining the relative rights between the Government and its employees in inventions. Paragraph 1(a) provides:

> The Government shall obtain the entire right, title, and interest in and to all inventions made by any Government employee—
>
> (1) during working hours, or
>
> (2) with a contribution by the Government of facilities, equipment, materials, funds, or information, or of time or services of other Government employees on official duty, or
>
> (3) which bear a direct relation to or are made in consequence of the official duties of the inventor.

However, paragraph 1(b) of the order provides that if the Government contribution as determined by the criteria of paragraph 1(a) is "insufficient equitably to justify a requirement of assignment to the Government," or if the Government is not sufficiently interested in an invention to require title, the executive agency concerned, if it has the approval of the Chairman of the Government Patents Board, shall permit the employee to retain title to the invention "subject, however, to the reservation to the Government of a nonexclusive, irrevocable, royalty-free license in the invention with power to grant licenses for all governmental purposes."

Paragraph 1(c) describes four categories of employment in the research and development field. These are, (1) to invent or improve any subject matter which falls within the class of patentable inventions; (2) to conduct or perform research or development work; (3) to supervise, direct, coordinate, or review Government financed or conducted research or development work; and (4) to act in liaison capacity among agencies or individuals engaged in such work.

If an employee is assigned or employed in any one of the four categories, paragraph 1(c) establishes the presumption that any invention made by him falls within the purview of paragraph 1(a). Any invention made by an employee whose assigned duties are outside the enumerated categories is presumed to fall under paragraph 1(b), in which case the employee retains the title, but gives a free license to the Government. Either of the presumptions of paragraph 1(c) may be rebutted by the facts or circumstances surrounding the making of a particular invention. Furthermore, notwithstanding all the foregoing provisions of the order, a determination under paragraph 1(d) is not precluded. This states that whenever the facts do not entitle the Government to either an assignment under paragraph 1(a) or a license under paragraph 1(b), the entire right, title and interest to the invention shall be retained by the employee, "subject to law."

One of the several noteworthy private contributions to the literature in this field is: "Federal Employee Invention Rights—Time To Legislate," by Marcus B. Finnegan and Richard W. Pogue.[30]

Messrs. Finnegan and Pogue submitted proposals for legislation which they believed would give equitable treatment to inventors in Government employ. Two objectives of the legislation would be (1)

[30] 55 Mich. L. Rev. 903-966 (1957).

that it be straightforward and direct, with a minimum of detailed administrative complication and (2) that treatment of each Government agency be uniform. The foundation of the legislation would be provided by the *Dubilier* [31] and other Supreme Court cases.

Section 4 of their proposed legislation sets forth the criteria for determination of rights:

> Except as otherwise provided by law, each agency shall determine rights in inventions made by employees of that agency in accordance with the following criteria and in accordance with such regulations as may be issued by the head of such agency in conformance with these criteria:
>
> (a) Title to any invention made by an employee shall be in the employee, subject to no rights in the Government (unless otherwise provided by law), unless the invention was made under circumstances described in (b) or (c) below.
>
> (b) Title to an invention made by an employee shall be in the employee, subject to a nonexclusive, irrevocable. royalty-free, worldwide license to the Government to practice and cause to be practiced the invention by or for the Government, if the invention was made or developed to practical form with a substantial contribution by the Government of time, facilities, equipment, materials, or funds, and the invention was not made under circumstances covered by (c) below.
>
> (c) Title to an invention shall be in the Government, subject to no rights in the employee, if the invention is the direct result of a specific hiring or assignment of duty to make the invention.
>
> (d) Notwithstanding the provisions of (c) above, if the agency concerned finds that the Government is entitled to an assignment of title to the invention but is insufficiently interested in the invention to publish the invention or to seek patent protection, it may determine that domestic and/or foreign title in the invention shall be left in the employee subject to a nonexclusive, irrevocable, royalty-free, worldwide license to the Government to practice and cause to be practiced the invention by or for the Government.

Howard I. Forman, in his book on U.S. Government patent policy [32] concluded that a central, governmentwide coordinate body was needed to establish a just and uniform system of patent rights. Although Executive Order 10096 came closest to attaining uniformity, he felt that the order, if strictly construed and implemented, would have created a good deal of antagonism and pointed out that it was deemed by some to be unconstitutional. He felt that there would be a good chance that a new order, returning the administration of the Government's patent rights to each of the individual departments and agencies, would replace Executive Order 10096. It would define anew the policy for deciding when a Government employee would keep title to his invention, and when the Government would take title thereto.

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[31] *United States* v. *Dubilier Condenser Corp.*, 289 U.S. 178 (1933).

[32] Forman, Howard I. Patents, Their Ownership and Administration by the U.S. Government, (New York, 1957).

In weighing the two policies, Mr. Forman said:

> Whether or not this probable reversion to a status of non-uniform interpretations of policy relating to the division between the Government and its employees of rights in the latter's inventions will be a serious loss is a matter of opinion. It would be nice, of course, if all Government agencies could think and react alike so that interested persons would know that decisions relative to ownership of employee inventions are the same in one agency as in another. A far greater loss that will occur if the Board is terminated is its potential for administering the Government's patent rights in the way the present author, as well as the National Patent Planning Commission, has recommended that they should be: to wit, to put those patents to work, doing the job patents were created for, namely, to promote the progress of the arts and sciences.

VI. AWARDS FOR SUGGESTIONS OR INVENTIONS OF GOVERNMENT EMPLOYEES

A. BACKGROUND

It has long been the practice in some of the Government agencies to reward employee inventors for meritorious suggestions and inventions. One of the first agencies to obtain such a law for its employees was the Ordnance Department of the Department of the Army. Under Public Law 227 (62d Cong.), enacted July 17, 1912,[33] cash awards were to be given employees for valuable suggestions for improvements or economies in manufacturing processes or plants. The Post Office Department, also in 1912, was granted authority to give rewards for inventions.[34] Other departments obtaining early legislation to provide such awards were the Department of the Navy, the Tennessee Valley Authority, and the Department of the Interior.

Concerning such awards, the findings and recommendations of the Attorney General in his report were as follows:[35]

> ***III. Rewards to employees***
>
> ***A. Findings and conclusions of Attorney General***
>
> 1. Any system of special financial rewards, promotions, or salary increases to employees on account of their making a patentable invention or discovery is undesirable because, by offering a premium to the employee who produces the invention, it may induce secrecy and lack of cooperativeness on the part of research and technical employees; it will involve administrative difficulties of selecting the person to be rewarded whenever the invention was the result of group endeavor; it may create dissatisfaction among unrewarded members of a research group as well as among personnel assigned to functions not likely to produce a patentable invention; and it may lead the employee to slight or ignore such functions.

[33] 37 Stat. 193 (1912), 50 U.S.C. sec. 58 (1952).
[34] Act of August 24, 1912, ch. 389, 37 Stat. 539.
[35] Investigation of Government Patent Practices, etc., vol. I, pp. 3-4 (1947).

2. A general system of cash bonuses, promotions, and salary increases for meritorious suggestions or ideas, regardless of whether they are patentable or not, would be free of these objections and may tend to remedy any inadequacies in the salary structure.

3. A valuable form of incentive and reward for outstanding scientific contributions and suggestions within the Government would be public, official, and professional recognition of meritorious contributions.

B. Recommendations of Attorney General

1. The establishment of a system of cash bonuses, promotions, and salary increases for scientific or technological suggestions or contributions should be left to the initial determination of each Federal agency, but as a matter of basic Government policy, no system should be maintained within any agency which in terms or in practice is limited to or emphasizes the patentable invention, or which offers greater reward for an invention than for other types of scientific or technological suggestion or contribution. Any reward system should make adequate provision for entire research groups or teams producing valuable scientific advances.

2. A system should be established, under the direction of the Government Patents Administrator, to provide for public, official, and professional recognition of meritorious scientific contributions and advances by Federal employees, through the issuance of certificates of merit by the President or the head of the Federal agency, announcements to the press, articles in scientific periodicals, and other forms of recognition.

3. All Government agencies adopting a system for rewarding valuable scientific or technological suggestions and contributions should report the operations and success of the system periodically to the Government Patents Administrator, who should correlate the experience of each agency, and inform, advise, and make recommendations from time to time concerning the operation and improvement of the system.

4. A survey should be made of the Government salary scale for scientific and technical personnel, in order that such upward revisions should be made as may be warranted by the recent rise in the cost of living and other pertinent factors.

B. LEGISLATIVE ENACTMENTS, 1946 TO DATE

1. PUBLIC LAW 600 (79TH CONGRESS), AUGUST 2, 1946

Public Law 600 [36] had its origin in H.R. 6533, introduced by Mr. Manasco, May 24, 1946. Section 14 of the bill, set forth below, provided for payment of cash awards to employees making meritorious

[36] 60 Stat. 809 (1946), 5 U.S.C. sec. 116a (1952).

suggestions. Both the House and Senate Committees on Expenditures in the Executive Departments reported the bill favorably (H. Rept. 2186 and S. Rept. 1636). The bill was passed by Congress and became Public Law 600.

Section 14 of the act reads as follows:

> SEC. 14. The head of each department is authorized, under such rules and regulations as the President may prescribe, to pay cash awards to civilian officers and employees (or to their estates) who make meritorious suggestions which will result in improvement or economy in the operations of his department and which have been adopted for use and to incur necessary expenses for the honorary recognition of exceptional or meritorious service: *Provided*, That no award shall be paid to any officer or employee for any suggestion which represents a part of the normal requirements of the duties of his position. With the exception of the War and Navy Departments, the amount of any one award shall not exceed $1,000 and the total cash awards paid during any fiscal year in any department shall not exceed $25,000. Payments may be made from the appropriation for the activity primarily benefiting or may be distributed among appropriations for activities benefiting as the head of the department determines. A cash award shall be in addition to the regular compensation of the recipient and the acceptance of such cash award shall constitute an agreement that the use by the United States of the suggestion for which the award is made shall not form the basis of a further claim of any nature upon the United States by him, his heirs, or assigns.
>
> Effective July 1, 1946, all other Acts or parts of Acts in conflict with provisions of this section are hereby repealed.

2. PUBLIC LAW 429 (81ST CONGRESS), OCTOBER 28, 1949

Public Law 429 [37] had its origin in H.R. 5931, introduced by Mr. Murray, of Tennessee, August 9, 1949, and S. 2379, introduced by Mr. Long, August 4, 1949. H.R. 5931 was reported out in H. Rept. 1264 and S. 2379 in S. Rept. 847. The final version adopted was reported out in Conference Report 1447. The House passed H.R.5931 and the Senate also passed it in lieu of S. 2379 and it became Public Law 429.

Section 1002 of title X thereof, provided for the establishment in each Government agency of an efficiency awards committee. The duties of the committee were:

> (1) to identify those supervisors and employees within the department whose superior accomplishments have contributed to outstanding efficiency and economy in administration and (2) to award to such supervisors and employees, * * * cash awards or increases in rates of basic compensation which * * * are commensurate with their demonstrated superior accomplishments: *Provided, however,* * * * such awards * * * shall not exceed 25 per centum of the estimated saving * * *.

[37] 63 Stat. 954 (1949), 5 U.S.C. sec. 1071 (1952).

3. PUBLIC LAW 763 (83D CONGRESS), SEPTEMBER 1, 1954

Public Law 763 [38] had its origin in H.R. 2263, introduced by Mr. Hagen, January 29, 1953. Title III thereof set forth an awards program for all Federal agencies and departments except the TVA. This section was part of a larger bill for postal pay increases. H.R. 2263 was reported out by the House and Senate Committees on Post Office and Civil Service (H. Rept. 1464, S. Rept. 1992, and Conference Rept. 2665), was passed and became Public Law 763.

The Senate report contains the following comment from the Civil Service Commission which strongly favored title III:

> by consolidating existing laws authorizing incentive awards, S. 2665 (similar to H.R. 2263) would simplify administration of a coordinated government program. The bill would also remove another obstacle to effective management by making the Civil Service Commission responsible for direction of the entire Government's incentive awards program. At present, this responsibility is diffused.

The Commission also endorsed the expanded coverage of the awards program, and the elimination of salary increases with cash awards substituted instead. It believed that the bill would correct inequities in existing statutory authorities covering awards for inventions, since under this bill, inventions would be covered under a governmentwide incentive awards program.

Important sections in the act include sections 304 and 305. Section 305 repealed certain laws, including Public Law 600 of the 79th Congress and Public Law 429 of the 81st Congress. Section 304 reads as follows:

> (a) The head of each department is authorized to pay cash awards to, and to incur necessary expenses for the honorary recognition of, civilian officers and employees of the Government who by their suggestions, inventions, superior accomplishments, or other personal efforts contribute to the efficiency, economy, or other improvement of Government operations or who perform special acts or services in the public interest in connection with or related to their official employment.
>
> (b) Presidential awards may be issued in addition to awards authorized in subsection (a).
>
> (c) Awards * * * may be paid notwithstanding the death or separation from the service of the officer or employee concerned * * *
>
> (d) A cash award under this section shall be in addition to the regular compensation of the recipient and the acceptance of such cash award shall constitute an agreement that the use by the Government of the United States or the municipal government of the District of Columbia of any idea, method, or device for which the award is made shall not form the basis of a further claim of any nature upon the Government of the United States or the municipal government of the District of Columbia by the employee, his heirs, or assigns.

[38] 68 Stat. 1105 (1954), 5 U.S.C. sec. 1105 (supp. IV 1957).

(e) Awards * * * may be paid from the funds or appropriations available to the activity primarily benefiting or may be paid from the several funds or appropriations of the various activities benefiting * * *

(f) An award under this title shall be given due weight in qualifying and selecting employees for promotion.

(g) A monetary award granted under this title shall not exceed $5,000, except that an award in excess of such amount but not in excess of $25,000 may be granted, with the approval of the Commission, in special cases in which the head of a department certifies to the Commission that the suggestion, invention, superior accomplishment, or other meritorious effort for which such award is proposed to be made is highly exceptional and unusually outstanding.

C. OTHER BILLS

1. S. 2665 AND S. 3507 (MR. CARLSON)—83D CONGRESS

S. 2665 was introduced on January 11, 1954, and S. 2307 on May 24, 1954. The provisions of both were similar to H.R. 2263, supra. No action was taken on either of them.

2. H.R. 7774 (MR. HAGEN)—83D CONGRESS

H.R. 7774, introduced February 8, 1954, contained a section establishing a uniform system for the granting of incentive awards as part of the Federal Employees Pay Act. The bill was reported out (H. Rept. 1344 and S. Rept. 1993). It was passed by both Houses, but received a pocket veto.

PART 2. INVENTIONS MADE BY NONGOVERNMENT EMPLOYEES OR BY GOVERNMENT FINANCED RESEARCH

I. THE ESTABLISHMENT OF AN INVENTIONS AWARDS BOARD

A. BACKGROUND

One important field, where it was felt that the patent laws could not always assure a proper compensation to the inventor, was in the field of national defense. The Government did not have a method of rewarding valuable, but possibly unpatentable suggestions; nor did it assure a proper return on inventions which were patentable. The Government has long solicited inventions and inventive contributions for national defense without being in a position to give proper awards for the invention, although in some cases, the invention had made important contributions to the saving of lives and the winning of the war. One of the ways suggested for solving this problem was to set up a board that would compensate for inventions, irrespective of their patentability. The following efforts have been made to effect this.

B. BILLS INTRODUCED

1. H.R. 7316, MARCH 31, 1952 (MR. CELLER)—82D CONGRESS

a. Provisions

This bill would authorize the establishment of an inventions awards board within the Department of Defense to recommend to the Secretary the making of awards for meritorious inventions substantially contributing to the national defense. The Board, appointed by the Secretary, would consist of 15 members from civilian life eminent in the fields of invention, science, research, development, and patent law, to serve for such terms as the Secretary shall specify. No award should be paid in any amount exceeding $75,000 until such award had been transmitted and approved by the Congress. Approval would be deemed to have been granted upon the expiration of the first period of 120 calendar days of continuous session of the Congress following its transmittal for approval, if no concurrent resolution were passed during such period disapproving the award.

b. Hearings and significant testimony

Hearings were held before Subcommittee No. 2 of the House Committee on the Judiciary on May 14, 1952, 82d Congress, 2d session, on H.R. 7316. Testimony of the witnesses is summarized below:

(1) *Representative Emanuel Celler* (pp. 4–6) presented the opening statement:

> The National Inventors Council, under the able chairmanship of Dr. Charles F. Kettering, has come to the conclusion that to stimulate the inventive genius of the United States

in all phases of invention of war material, it is necessary to appropriately remunerate inventors promptly. Reports from various authorities on the subject of awarding compensation to inventors were carefully studied and the National Inventors Council conducted an informal canvass of inventors whose inventions had been processed through the Council. As a result, it was found that there was needed a great deal of improvement in the methods of properly and promptly compensating inventors.

Mr. Celler felt that the present awards system was inadequate, since it mainly affected Government employees and did not specifically provide for contributions of an inventive nature.

He described the Inventions Awards Board, as provided for in the bill, as a board to which inventors could go if they were not satisfied with their compensation or treatment by defense agencies. Awards that exceeded $75,000 would become effective 120 days thereafter unless Congress took adverse action. The Board would handle awards to both Government and non-Government employees.

The term "invention" was defined in the bill as any new art, machine, manufacture, composition of matter, or any new improvement thereof, which is useful in the national defense of the United States. Mr. Celler remarked that this definition should clarify the point that patentability is not an issue under the act. He said the three requirements for eligibility for award were: (1) that the invention be a new process or device which is useful in the national defense; (2) that the invention be communicated to a defense agency; and (3) that the agency actually use the invention.

(2) *John C. Green*, representing the National Inventors Council (pp. 6–11), told why the Council supported this legislation. The Council had done much to solicit inventions, but did nothing in the way of determining whether the inventor should receive any recognition if any invention were adopted. It was recognized that inventors should be properly compensated for their inventions, but many difficulties were encountered in securing proper remuneration. As a result, inventions for national defense did not receive the benefits of free enterprise, as would other inventions. First, inventors felt they could not spend a great deal of time and money in their inventive efforts since the return of the investment was so indefinite and, second, they had only one possible customer—the Army, Navy, or Air Force.

Another discouraging factor was that in the great maze of governmental machinery, the inventor and his invention often became separated. Even if he were able to follow through, he found himself confronted with many rules and regulations which were extremely difficult for him to follow and, in many instances, precluded his receiving any compensation. One of these rules was the requirement of the armed services that if an invention is first actually reduced to practice through use of Government money, the inventor must give the Government a royalty-free license. This regulation might be inequitable if the Government were the only customer. Another difficulty was the fact that in many instances the suggestions did not disclose an "invention" falling within the protection of our patent laws and yet it could be of extreme benefit to the services.

Mr. Green explained that this legislation would set up an Awards Board which would recommend a suitable reward to the inventor, or to which the inventor could go if he were not satisfied with the compensation he was offered by the Armed Forces.

(3) *George N. Robillard*, representing the Department of Defense (pp. 11–19), urged the passage of H.R. 7316. He suggested that those who contributed time and money to the invention might receive some award as well as the inventor. He also stressed the fact that the invention should be "original;" that someone who has searched the Patent Office files and has dug up an old idea and adapted it, should not be eligible for an award.

(4) *E. Burke Wilford*, aeronautical research engineer (pp. 19–25), suggested four changes to the proposed bill: (1) Awards for inventions should not be limited to the Department of Defense; (2) an award should be possible to the inventor regardless of ownership of patents; (3) $75,000 as the top figure payable without the approval of Congress should be raised, perhaps to $150,000; and (4) an inventor should be permitted to receive an award, even if he had been previously compensated if "such past compensation has been wholly inadequate or grossly inequitable."

Mr. Wilford attributed the difficulties in benefiting from any invention in the aeronautical industry, to obstacles in getting a basic patent, the short life of an aircraft patent, and the difficulty of establishing the validity of the patent during this time. About the awards system of the NACA, he said:

> The private designer has practically no chance of collecting even his research and development costs for he is bound to be stopped by one of these three hurdles mentioned above. In the meantime, he starves, is embittered, wastes his creative years when he can be of the most service in aeronautics. What happens in most cases is that he is forced by necessity to work in the big company's engineering departments on detailed design work; or independently on simple gadgets which he can sell and produce with his limited income or go to work on routine testing in a Government laboratory. The creative mind is too scarce and valuable an article to be wasted in this type of work. It is fed by inspiration and appreciation, not by routine reason or work.

(5) *Carl T. Mack*, of the American Patent Law Association (pp. 25–28), said that the association was in agreement with the general principles of the bill. He described the present situation as one in which the Government solicited inventions for its use, whether patented or not, and then, after using the invention, employed all its defensive power to resist payment to the inventor of the compensation for use contemplated by the patent laws. In order for the Government to play fair with inventors, he felt it should provide some nontechnical system for rewarding those whose ideas were adopted and used.

(6) *T. Hayward Brown*, Department of Justice (pp. 28–34), favored the legislation, and advocated including the National Inventors Council as one place to communicate ideas.

(7) *Fritz G. Lanham*, representing the National Patent Council (pp. 37–40), warned against any legislation which might weaken our patent system. He said that the bill was not restricted to discoveries useful in national defense, but would deal with discoveries of every character and kind. He felt that this might conflict with the administration of laws entrusted to the Patent Office.

c. Action taken

A committee print was drafted on May 24, 1952, which amended H.R. 7316. No action was taken during the 82d Congress.

2. H.R. 639, JANUARY 5, 1955 (MR. CELLER); H.R. 2383, JANUARY 17, 1955 (MR. CRUMPACKER); AND S. 2157, JANUARY 9, 1959 (MR. CAPEHART)—84TH CONGRESS

a. Provisions

H.R. 639 was similar to H.R. 7316, 82d Congress, discussed supra. The procedure and pertinent factors to consider in making an award were as follows:

> SEC. 7. (a) In any proceeding under this Act, the applicant shall bear the burden of establishing by probative proof the disclosure of the invention in question by the inventor directly or indirectly to a defense agency and the use of such invention by a defense agency in consequence of such disclosure, except that—
>
> (1) in the case of a patented invention, proof of the issuance of a patent thereon shall constitute proof of disclosure of such invention to a defense agency; and
>
> (2) in the case of an invention described in a patent application which has been duly filed and has been placed under secrecy pursuant to any provision of law, proof of access to such application by any officer or employee of any defense agency shall constitute proof of disclosure of such invention to such agency.
>
> (b) In any proceeding under this Act, the respondent defense agency or agencies shall be entitled to assert any legal or equitable defense which could be asserted by the United States in any suit brought by the applicant against the United States for judicial relief on account of the use of the invention in question by the United States, except that—
>
> (1) the worth of such invention shall be measured by its contribution to the needs of national defense, and not by the advance it makes in the field to which it pertains;
>
> (2) the validity of any patent issued to the inventor for such invention shall be presumed in the absence of competent proof of the invalidity of such patent; and
>
> (3) proof that the disclosure made by the inventor to any defense agency was sufficiently specific to permit the making or practicing of such invention shall constitute proof of the actual reduction of such invention to practice.

H.R. 2383 was similar to H.R. 639, in that it would establish the board within the Department of Defense and in the composition and qualifications of the members of the board. H.R. 2383 provided that approval by Congress shall be deemed to have been granted upon the expiration of the first period of 6 months of continuous session.

Section 7 of H.R. 2383 differed from H.R. 639. It provided:

> SEC. 7. (a) In any proceeding under this Act, the contributor shall bear the burden of establishing the communication of the contribution in question, except that the submission of a contribution to the National Inventors Council and by that council to a defense agency shall constitute proof of communication.
>
> * * * * * [39]
>
> (e) A contributor shall not be barred from eligibility for an award on the ground that he has given the Government a license under his invention either with or without receipt of cash consideration or by virtue of the fact that the Government claims an equitable license under his invention.

S. 2157 was similar to H.R. 2383.

b. Hearings and significant testimony on H.R. 639 and H.R. 2383, House of Representatives

Hearings were held before subcommittee No. 3 of the House Committee on the Judiciary on H.R. 639 and H.R. 2383 on May 24 and June 13, 1955.

(1) *Representative Celler* (pp. 7–8) presented a statement describing the need for compensating inventors for inventions relating to national defense. He said:

> The bill proposes the establishment within the Department of Defense of an awards board, consisting of persons from civil life, adequately qualified to judge and evaluate the contributions made by the inventor. The board would be authorized to recommend awards in any amount, and the Secretary of Defense would be authorized to pay the award if it did not exceed $75,000.

Under Mr. Celler's bill (H.R. 639) the inventor entitled to an award could not, after accepting an award, maintain an action for patent infringement against the Government for the use of the same invention. And to be eligible for an award, the inventor must have communicated his idea to the Government and the invention must have been adopted and used.

(2) *John C. Green,* National Inventors Council, Department of Commerce (pp. 8–13), again described the need for the awards and stated that many inventors were quite bitter at not receiving any compensation or credit for their defense ideas.

(3) *Fritz Lanham,* representing the National Patent Council (pp. 13–23), appeared before the committee to oppose the bills which, he said, "would seriously threaten impairment and finally perhaps destruction of our fundamental patent system."

[39] There is no equivalent to subsec. (b) of H.R. 639.

Mr. Lanham believed that the already existing National Inventors Council, properly amended from the standpoint of awards, would protect us in inventions for national defense and not do violence to our fundamental patent system. He believed that to determine whether a contribution was "novel, original, etc.," would require an inspection of Patent Office records, and that if the contribution contained these requirements, it would be eligible for a patent.

(4) *Ray M. Harris*, patent adviser, Office of Assistant Secretary of Defense for Supply and Logistics (pp. 23–30), told how either paying off a patentee or entering into a contract with the inventor runs into difficulties. If the Department of Defense is to pay off a patentee, it insists that the patent be valid, and its attorneys apply all legal defenses. It may not wish to enter into a contract with the inventor because he might not be the type of person the Department could work with or he might have a classified item the Defense Department would like to develop itself. Under H.R. 2383, a payment could be made to inventors whether or not they had a patent and even though the patent was invalid; and if the patent were valid the inventor still might prefer to accept the award rather than wait until the Department of Defense had applied all its defenses to contesting the patent. "Quite often an inventor is dead before he gets his money."

Mr. Harris did not believe the proposal would threaten the patent system since nobody is denied his right to apply for a patent, and he has the option to seek compensation either under the patent law or from the awards board. In answer to objections, Mr. Harris stated that he did not believe patent attorneys would suffer by passage of the law, since it would give them the additional task of presenting claims to the awards board. He believed the only serious objection was that the awards board would be authorizing payment of money where there was no property right. This brings up the question of "inventive contribution." Mr. Harris defined "inventive contribution" as that kind of subject matter for which you could get a patent, if it were patentable.

(5) *M. A. Sterner*, an inventor (pp. 35–64), presented bitter testimony to the committee concerning the treatment of inventors, especially by the Department of Defense. He accused the Department of Defense of modifying the invention and then taking it away. He said:

> Now, they have a right to take, but they do not have a legal right to take without compensation. But they do.

Mr. Sterner presented cases where the Government had used inventions and then refused to pay. He said:

> The United States can no longer afford to refuse payment to inventors and leave great inventions to haphazard chance. We no longer have the lead over Europe and Russia in invention. Inventor's incentive is crushed, and too many inventors die in poverty or as suicides even today (like the brilliant Tesla and Armstrong).

(6) *E. Burke Wilford* (pp. 64–67) suggested three things: (1) that inventions be screened in the National Inventors Council and directed properly; (2) that the Defense Department employ persons in the patent department who are sympathetic to new ideas and who don't

just discourage the inventor—and that the inventor be hired as a consultant if the Department gives the research and development of the inventor's contribution to someone else; and most important, (3) there must be a way of compensating within the patent law, and also outside of the patent law, for inventive contributions which are of great service.

(7) *Edwin H. Arnold,* chairman of the committee on patents of the National Association of Manufacturers (pp. 68–69), opposed the passage of either H.R. 639 or H.R. 2383. He praised the patent system as a great incentive to invention. About the Defense Department he said:

> The only reason the patent incentive is not now working equally well for defense is that the Government officials concerned cancel out the incentive of the patent law by the way they treat inventors whose improvements are, or could be, useful for defense purposes. These inventors are usually relegated to the Court of Claims for testing their claims which in most cases is equivalent to a flat refusal of consideration.
>
> The real cure for the situation is a complete change of attitude in the Defense Department as to the treatment of inventors of improvements for defense.

Mr. Arnold mentioned four ways to encourage invention, other than the change of attitude referred to above:

> 1. When one department of the Government duly grants a patent, let the other Government departments treat it as valid in accordance with the presumption now expressly stated in the law, instead of spending tax money immediately to reexamine the question.
>
> 2. Provide quick and simple procedure in district courts for determining the value of Government defense use.
>
> 3. Let there be no statute of limitation as to Government use (which is often necessarily secret for long periods in some cases).
>
> 4. Remit Patent Office fees as to any applications for patent on inventions forwarded to the armed services by the National Inventors Council.

(8) *James Rankin Tod,* patent adviser, British joint services mission (pp. 73–82), described the Royal Commission in England. A claimant makes an application, it is examined, and if the Royal Commission decides an award should be given, it asks the Treasury to make one. If the conclusion is negative, i. e., that no award is justified, the claimant can ask for permission to appeal. The question of allowing or not allowing appeal is discretionary in the Crown.

(9) *Representative Crumpacker* (pp. 82–86) discussed the need for legislation rewarding inventors. He said:

> In summary, the need is for providing a supplementary system for compensating inventors. I think it is very well pointed up by the testimony we had at our last session, that only 1 out of 100 inventors who produced ideas or contributions that were actually used in the defense effort in World War II received any compensation, and the fact that the patent system did not provide any compensation for

the 99 who received nothing I think is enough eloquent testimony of the need for some supplementary system. Inventions for military purposes which have no civilian market which can be exploited, and the limitations of Government procurement procedures which in most instances bar any such inventions from compensation because of rules and regulations and acts of Congress, it seems to me provide an adequate basis for this legislation.

c. Action taken on H.R. 2383, House of Representatives

Report No. 1432 from the House Committee on the Judiciary, on July 26, 1955, reported favorably on H.R. 2383, with an amendment. The only major difference in the committee substitute bill was that the committee amendment placed authority to determine awards in the National Inventors Council (Department of Commerce) rather than set up a separate Awards Board within the Department of Defense. The committee, in conferring jurisdiction on the National Inventors Council, did so for the reason that the council is an established, functioning body which, without too much difficulty, can be equipped to handle the subject matter of this legislation. An Awards Board, on the other hand, would have to be newly created. It felt that the National Inventors Council consisted of persons qualified to judge and evaluate contributions.

The committee stressed the fact that the bill provided an award for an inventive contribution whether or not the contribution is "patented, unpatented, or unpatentable, or whether or not original with the contributor, new or if not amounting to an invention." The term "invention," which was contained in the earlier bill, was broadened to "inventive contributions" to emphasize the double standard intended, namely, (1) the contribution must be of an inventive nature, but not necessarily patentable, and (2) it must be a contribution to national defense.

H.R. 2383 passed the House with the amendment on July 30, 1955, and was referred to the Senate.

d. Hearings and significant testimony on H.R. 2383 and S. 2157, Senate

Hearings were held before the Subcommittee on Patents of the Senate Committee on the Judiciary, June 7, 1956. Testimony of witnesses was as follows:

(1) *Representative Crumpacker* (pp. 7–26) testified in favor of the bill. He felt that the patent system was inadequate when it came to compensation of inventors whose inventions were used by defense agencies. His reasons were: (1) The Department of Defense and other Government agencies have ruled that the invention must be reduced to final form, i.e., that it be a working item, before compensation can be paid to the inventor, whereas many inventions involve such complexity and expense that the individual inventor is unable to produce the final working model himself. (2) Many inventions for defense have no commercial application. (3) The Army, Navy, or Air Force is the only possible customer. There was some discussion of whether the contributor (the communicator of the idea) or the inventor should receive the award.

(2) *M. A. Sterner*, inventor (pp. 27–37), testified in favor of the bills, telling of the need for some stimulation to the inventor. He believed that the inventor, not the contributor, should receive the award.

(3) *William R. Ballard*, adviser to the committee on patents, National Association of Manufacturers (pp. 37–48), stated the policy of the NAM. He said:

> The U.S. Government should recognize the importance of adequate incentives to those who contribute inventions of other technical information used in the national defense. To this end the Secretary of Defense should be authorized and encouraged to pay fair and reasonable compensation for any lawful disclosure to the Department of Defense of any useful invention or other technical information that is, as a result of such disclosure, used or caused to be used for defense purposes by the Department of Defense.

(4) *E. Burke Wilford*, inventor, representing the Convertible Aircraft Pioneers (pp. 47–50), testified in favor of the bill. He suggested the following changes or additions: (1) that the words "natural person" be changed to "natural persons," since there might be two inventors; (2) permit a degree of retroactiveness, at least as to things that are now under development; and (3) that an appeal to the National Inventors Council be permitted where the Defense Department does not treat the inventor properly.

(5) *Richard Whiting*, chairman, committee on patent legislation, American Patent Law Association (pp. 50–52), opposed passage of the bill. Some reasons for his opposition were:

> (1) With respect to inventions which are the subjects of valid patents, the legislation does not seem to take adequate cognizance of the Court of Claims procedure and seek to expedite it, but rather, it seems to supplement that system with a secondary type of system relying on rewards as a sort of grace rather than legal right, and with duplication by the Department of Defense of the provinces of both the Patent Office and the Court of Claims.
>
> I may be mistaken, but my impression of this bill is that its primary purpose is to pay money to the owners of bad patents.
>
> (2) With respect to unpatentable ideas, the legislation does not adequately deal with the subject because it is confined to the treatment of contributions within the scope of the fields contemplated by the Patent Office, namely, any art, machine, manufacture, composition of matter, or any new and useful improvement thereof, without regard to any concepts not falling within these patentable categories, of which there may be many that have made valuable contributions to the national defense.
>
> (3) The legislation is very loosely drawn, and its interpretation is in many instances most obscure.

However, Mr. Whiting felt that there was much to be done in the field of providing adequate reimbursement by the Defense Department to inventors or other contributors for those ideas that are genuinely worthwhile.

(6) *Fritz G. Lanham*, representing the National Patent Council (pp. 53–57), opposed the bill because "they would have a damaging effect upon our national economy; and, in the second place, they involve a wrong approach to such problem as may exist." He felt that boards and commissions such as the one proposed weakened the patent system.

(7) *John C. Green*, director, Office of Technical Services, Department of Commerce (pp. 58–62), felt that when the Department of Defense used an invention, it should pay for it. He did not feel that inventors should be "rewarded," but should be paid and that the policy of the Defense Department should be changed to make the latter more willing and generous in its payments.

(8) *Ray M. Harris*, patent adviser, Office of Assistant Secretary of Defense for Supply and Logistics (pp. 62–80), testified in favor of the bill. He felt that it did not conflict with the Patent Office.

Neither H.R. 2383 nor S. 2157 was reported out by the subcommittee prior to adjournment.

3. H.R. 103, JANUARY 3, 1957 (MR. CELLER)—85TH CONGRESS

a. Provisions

H.R. 103 was identical to H.R. 2383 which passed the House in the 84th Congress. It would authorize the National Inventors Council within the Department of Commerce to recommend to the Secretary the making of awards for meritorious inventions substantially contributing to the national defense. No awards should be paid in any amount exceeding $50,000 until such award has been transmitted and approved by the Congress. Approval shall be deemed to have been granted upon the expiration of the first period of 6 months of continuous session of the Congress following its transmittal for approval, if there has been no concurrent resolution passed during such period disapproving the award.

b. Action taken on H.R. 103

H.R. 103 was reported out favorably by the House Committee on the Judiciary on February 21, 1957 (H. Rept. No. 148). In its statement, the committee summarized the problems as follows:

> The present awards systems in Government are inadequate and complex. They mainly affect Government employees and do not specifically provide for contributions of an inventive nature. Accordingly, an inventor must look solely to the obtaining of a patent and rely upon his patent rights to enforce a claim against the Government, should his invention be adopted and used.
>
> There is one field in particular in which the patent laws do not serve to assure a proper award to the inventor. This is the field of inventions relating to national defense. In many instances, this contribution is not of a type which can be patented. * * * Or it is not the type which, even if patented, can assure any adequate commercial return to the inventor. * * * Even when the invention is patentable, many inventors cannot afford to go through the long process

> of obtaining a patent and then prosecuting a claim for patent infringement against the Government. * * * As a result, there is little incentive for them to invent for purposes of national defense.

4. OTHER BILLS

Other bills introduced, similar to those discussed above, were: In the 83d Congress: S. 27, January 7, 1953 (Mr. McCarran); H.R. 392, January 3, 1953 (Mr. Celler); and H.R. 5889, June 23, 1953 (Mr. Crumpacker).[40] In the 85th Congress: H.R. 8420, June 27, 1957 (Mr. Nimtz); S. 1074, February 7, 1957 (Mr. Capehart); and S. 3721, April 29, 1958 (Messrs. Saltonstall and Capehart).

II. NATIONAL SCIENCE FOUNDATION

A. BACKGROUND

Toward the end of World War II, the Nation's leaders, having observed the significant contributions of science and technology in the field of military science, turned their attention to the tremendous potentialities of scientific research in a peacetime economy. The result was a series of reports, studies and legislation, in which there was remarkable unanimity in the view that a greatly enlarged nation-wide program of research and development in the basic and applied sciences, generously supported by the Federal Government, was highly important to the future prosperity and security of the United States.

The importance of increased emphasis on research and development had been stressed in the 1938 report to the National Resources Committee.[41]

Three subsequent reports called for legislation to establish a National Science Foundation:

(1) The Subcommittee on War Mobilization Report No. 5 [42] investigated the wartime mobilization of scientific personnel and facilities and called for continuing a high level of research in the post-war period.

(2) Dr. Vannevar Bush's report [43] pointed out the great need for scientists and the necessity for attracting youthful talent into the sciences. In calling for the creation of a permanent overall Federal agency for the support of science, Dr. Bush warned:

> Without scientific progress the national health would deteriorate; without scientific progress we could not hope for improvement in our standard of living or for an increased number of jobs for our citizens; and without scientific progress we could not have maintained our liberties against tyranny.

(3) The Steelman report [44] declared that the security and prosperity of the United States depended upon the rapid extension of scientific knowledge. It felt that this extension was so important that it could

[40] Also, in title 3 of Public Law 763 (68 Stat. 1105), which was passed by the 83d Congress, there was provision for Government employees' inventive awards, but it did not reach non-Government employees.
[41] National Resources Committee, Research—A National Resource. vol. 1 (November 1938).
[42] Subcommittee on War Mobilization, report to the Committee on Military Affairs, U.S. Senate. "The Government's Wartime Research and Development, 1940–44." January 23 (pt. 1), July 23 (pt. II), 1945.
[43] Vannevar Bush. "Science: The Endless Frontier." A report to the President (July 5, 1945).
[44] John R. Steelman, chairman, The President's Scientific Research Board. "Science and Public Policy, A Report to the President," vols. I–V (Aug. 27, 1957).

reasonably be said to be a major factor in national survival. Like the Bush report, it recommended that a National Science Foundation be created to promote scientific research and development.

B. SYNOPSIS OF THE LEGISLATION

In the 79th Congress, a number of bills were introduced to establish a National Science Foundation. Both the House and Senate held hearings, but only the Senate reported out a compromise bill (S. 1850). The Senate passed S. 1850, but the House took no action and all bills died at the end of the second session.

In the 80th Congress, 1st session, S. 526 was introduced in the Senate, reported out and passed. Many bills were introduced in the House, and hearings were held. H.R. 4102 was reported out. The House passed S. 526 in lieu of H.R. 4102. S. 526 died as the result of a pocket veto. In the second session, S. 2385 and H.R. 6007 were introduced. Hearings were held by the House, and H.R. 6007 was reported out. S. 2385 was also reported out and passed by the Senate, but the bill failed to reach the House floor. Thus, no actual legislation on the subject materialized during the 80th Congress.

In the 81st Congress, S. 247 was introduced in the Senate, reported out and passed. Many bills were introduced in the House, hearings were held, and H.R. 4846 was reported out. The House passed S. 247 in lieu of H.R. 4846; and S. 247, creating the National Science Foundation, became Public Law 507 on May 10, 1950.

The 83d Congress brought forth an amendment (S. 977) which became Public Law 223, August 8, 1953.

There follows a detailed analysis of the legislation proposed to create the National Science Foundation.

C. 79TH CONGRESS

1. IMPORTANT BILLS INTRODUCED—SENATE

a. S. 1285, July 19, 1945 (Mr. Magnuson)

(1) Direction. Powers were to be vested in a Board of nine members (no compensation) appointed by the President on a basis of demonstrated capacity for the job and not on an ex officio basis. A Director ($15,000 a year) was to be appointed by the Board.

(2) Functions. The Foundation was directed to promote a national policy for scientific research and scientific education. It set up a Board of National Defense, a Division of Medical Research, and a Division of Physical Sciences. It authorized the Foundation to support scientific research through contracts, grants, or other forms of assistance. The Foundation might acquire, but not operate, any scientific or technical facilities of its own.

(3) Information and inventions. It set up a Division of Publications and Scientific Collaboration and authorized the Foundation to publish and disseminate information of scientific value, consistent with requirements of national security. The Foundation, like other Government agencies, was left with full power to negotiate such patent arrangements with research contractors as particular situations might require in the public interest.

It set up a Division of Scientific Personnel and Education to grant scholarships and fellowships in the mathematical, physical, and biological sciences. Persons who received such scholarships and fellowships were to be enrolled in a National Science Reserve and be available for call by the Government for scientific and technical work in times of national emergency.

b. S. 1297, July 23, 1945 (Messrs. Kilgore, Johnson, and Pepper)

(1) Direction. Powers were to be vested in a Director ($15,000 a year) appointed by the President. A National Science Board, consisting of eight Government officials plus eight public members appointed by the President were to act in an advisory capacity.

(2) Functions. The Foundation was directed to survey and study all Government-financed research and development activities, and to send to the President and to the agencies concerned recommendations for such changes as appeared desirable.

It set up a Research Committee for National Defense (20 percent of the funds); a Research Committee for Health and the Medical Sciences (20 percent of the funds); and authorized research in the national interest, including research in basic sciences, natural resources, methods and processes beneficial to small business, and peacetime uses for wartime facilities. It directed the Foundation to use existing facilities of Federal, State, and local governments, educational institutions, research foundations, and private industrial organizations. At least 50 percent of the funds were to be spent in nonprofit educational institutions. New facilities might be acquired, but not be operated, by the Foundation itself. All research was to be done under contract only.

(3) Information and inventions. The Foundation was directed to make available to the public full data on all significant findings. Also, by means of publications, abstracts, library services and the like, it was to promote a widespread distribution of information useful in research. It authorized the Defense Committee to classify information when necessary for national security.

As to patents, it provided that any invention, discovery, or finding resulting from a research project financed in whole or in part by the Federal Government shall be the property of the United States. The Director, acting on behalf of the Federal Government, shall patent without fee all significant inventions or discoveries resulting from research and development projects. Any invention, discovery, or patent which is or may become the property of the United States shall be licensed by the Foundation nonexclusively and free of royalty to persons desiring to use it, upon proper application in accordance with procedures established by the Foundation, except that a license may be denied or revoked upon a finding by the Department of Justice that the license will promote monopoly or restraint of trade. That Department, upon request by the Director, shall intervene in behalf of any licensee of the Foundation in any infringement litigation brought against him growing out of the issuance of the license.

c. Working draft of S. 1297 (amendment in the nature of a substitute), intended to be proposed by Mr. Kilgore and Mr. Magnuson

(1) Direction. Powers vested in a Director, appointed by the President. A National Science Board shall act in an advisory capacity.

(2) Functions. Director authorized to finance research and development activities, grant scholarships, and recommend desirable changes to the President to promote science and technology.

(3) Information and inventions. Director to make available full data on all inventions, discoveries, and significant findings arising out of Government-financed research.

As to patents, the Government agencies would not have the authority to adjust patent policies to the equities of a particular situation, but all Government agencies would be required to acquire full patent rights to all discoveries resulting from research financed in whole or in part by the Government.

d. S. 1850, February 27, 1946 (Messrs. Kilgore, Magnuson, Johnson, Pepper, Fulbright, Saltonstall, Thomas (Utah), and Ferguson)—reported out of committee

(1) Direction. Powers vested in an Administrator, who would consult with scientific committees and a National Science Board.

(2) Functions. Major functions would be the support of research and development by financing development activities by public and private organizations; by awarding scholarships and fellowships in any field of science; and by coordinating governmental research.

(3) Information and inventions. Widest dissemination of ideas and information was provided for by (1) providing for freedom of discussion and publication by persons engaged in research; (2) requiring Government contractors engaged in research or development to make full reports of all discoveries; (3) making significant scientific and technical information available to the public; and (4) exchanging of scientific and technical information with other nations.

As to patents, S. 1850 required that any invention produced in the course of federally financed research and development be freely dedicated to the public. The Government would receive the patent rights to its contracted research, and only in cases where the contractor had made a substantial independent contribution to the invention could the Government agree to leave the patent rights with the contractor.

e. Comparison of foregoing bills

Both versions of S. 1297 and S. 1850 differed from S. 1285 in that they (1) vested power in a Director rather than a Board; (2) contemplated somewhat more active research and control; and (3) made specific provisions for Government ownership of resulting inventions and patents.

44515—60——4

f. Related bills

H.R. 1248, July 9, 1948 (Mr. Fulbright)—to be discussed in following section.
S. 825, April 4, 1950 (Mr. Byrd).
H.R. 3440, June 11, 1945 (Mr. May).

2. HEARINGS AND SIGNIFICANT TESTIMONY—SENATE

a. In general

Although almost unanimous approval was given the legislation, several points were disputed. The two most important of these were the form of organization and the patent policy.

As to the form of organization, both the Magnuson and the Kilgore bills advocated the creation of the Foundation as an independent agency of the Government. The Magnuson bill (S. 1285) vested the powers of the Foundation in a board of nine men selected by the President on the basis of their demonstrated capacity for the work of the Foundation and without regard to political affiliations. The Kilgore bill (S. 1297) vested the powers of the Foundation in a single director with an advisory board made up largely of Government officials.

As to patent policy, the Magnuson bill left the Foundation free to work out patent arrangements with its research contractors, in terms of the public interest, as the facts of particular cases required. Under the Kilgore bill, all Government agencies acquired full patent rights to all discoveries resulting from research financed in whole or in part by the Government.

Another point brought out in the hearings was the relationship of the Foundation to other agencies. There was some fear expressed that the Foundation might interfere with or replace or control research programs of existing organizations, both public and private.

The exemption of part-time advisory personnel from certain provisions of the Criminal Code was another recommendation advanced in the hearings. The Magnuson bill provided a formula to make it possible to serve as an adviser to the Foundation and still operate in a private capacity, with certain limitations.

A point that was repeated by most of the scientists was the importance of allowing the scientist complete freedom of choice in the conducting of his research. Also, they declared that science was greatly hampered by useless security restrictions. They all warned of the danger of not encouraging youthful talent to pursue careers in science and recommended scholarships and fellowships. They all agreed that the United States needed to place increased emphasis on basic research.

Whether or not the social sciences should be included in the research supported by the Foundation was another question raised in the hearings.

The Senate hearings were held by a subcommittee of the Committee on Military Affairs, from October 1945 to March 1956.

b. Specific witnesses

(1) *Senator Harley Kilgore* (pp. 1–9) in his opening statement declared:

> I should like to call your attention to the fact that this revised version of S. 1297 embodies the major provisions recommended in the President's message of September 6, 1945, in Dr. Bush's report to the President,[45] and in the previously published reports of the Subcommittee on War Mobilization. These include:
>
> (*a*) The establishment of a single agency to provide substantial Federal support for scientific research and development.
>
> (*b*) Specific provisions for the support of research essential to national defense.
>
> (*c*) Specific provisions for the support of research in health and the medical sciences.
>
> (*d*) Provision for a program of fundamental research in all basic sciences.
>
> (*e*) Provision for a program of fellowship and scholarships necessary to assure an ample supply of well-trained scientific personnel.
>
> (*f*) Assurance of freedom of research activity and reporting of research findings without restraint, except as necessary for national security.

Senator Kilgore pointed out the difference between S. 1285 and S. 1297 in regard to organization and patents. Neither of the bills included the social sciences, and both provided that recipients of Foundation scholarships and fellowships should be enrolled in a National Science Reserve, subject to call by the Federal Government in times of emergency.

The first four witnesses to appear, following Senator Kilgore, were: (2) *Isaiah Bowman*, Johns Hopkins University (pp. 10–24); (3) *Irving Langmuir*, associate director of the laboratory, General Electric Co. (pp. 24–44); (4) *Harlow Shapley*, director, Harvard University Observatory (pp. 47–67); and (5) *C. F. Kettering*, president and general manager, General Motors Research Corp. (pp. 67–78). All four of these believed that the Federal Government should support scientific research, and most wanted a broad program including the social sciences. They all preferred an organization headed by a board rather than by a single administrator. They also stressed the need for freedom in carrying out research. Dr. Langmuir told of the tremendous scientific program in which the Russians were embarking—greater than in any other country.

(6) *Howard A. Meyerhoff*, executive secretary, American Association for the Advancement of Science (pp. 83–93), presented answers to a questionnaire submitted to members of his association. Regarding

[45] Vannevar Bush, op. cit., supra, note 43.

the structure and organization of the National Research Foundation, he reported that there was no unanimity, for reasons too complicated to explain. It was clear that the fear of a "politically controlled" foundation was widespread, and for this reason there was a strong preference for a board composed of scientists, either as provided by the original Magnuson bill (44 percent) or under the National Academy of Sciences as provided by the May bill [46] (26 percent). Only 10 percent wanted a paid director. Sixty-five percent believed that the coordination of research activities among all Government agencies should be a primary function of the new agency. Eighty-six percent thought money should be spent in existing Government laboratories, 70 percent in educational and nonprofit institutions, 41 percent in private industrial laboratories, and 39 percent in new Government laboratories. Forty-three percent thought patents should go to the originator and 23 percent thought they should go to the Government. Seventy-five percent wanted international and national dissemination of information. Sixty-four percent wanted international collaboration.

(7) *Harold D. Smith*, Director of the Bureau of the Budget (pp. 95–112); (8) *Russell Smith*, legislative secretary, National Farmers Union (pp. 120–136); and (9) *Henry A. Wallace*, Secretary of Commerce (pp. 137–159), all supported the Kilgore bill, advocating a single administrator to head the foundation. They also were agreed that the Government should get the patents from research that it supported. They also stressed the importance of wide dissemination of research findings. Mr. Russell Smith declared that:

> The patent laws should be revised with the objective of bringing to the whole population as rapidly as may be possible the fruits of research and ingenuity. All processes, etc., * * * developed by Government research should remain the property of the Government.

(10) *J. C. Hunsaker*, Chairman, National Advisory Committee for Aeronautics (pp. 112–117); and (11) *Lewis G. Hines*, legislative representative of the American Federation of Labor (pp. 117–120), favored the Magnuson bill. They believed that responsibility should rest with a board and not with a single individual. They both believed that patent matters should be determined by existing law, with respective rights determined on the merits of the cases as they arose. Mr. Hines declared that:

> It is the general practice both in the Government and in private industry that patents covering inventions and discoveries shall belong to the agency financing the research.

(12) *R. J. Dearborn*, chairman of the Patent Committee of the National Association of Manufacturers (pp. 169–188), also favored S. 1285, the Magnuson bill. In speaking of the patent policy of federally financed projects, he said:

> Therefore, regardless of time, money, or effort expended by an inventor, or contractor, he could not retain any portion of the rights to his invention in case he had accepted any financial assistance whatsoever from the Government. Inventors and research laboratories might well hesitate to

[46] H.R. 3440. See infra, p. 38.

> conduct research on such terms, and thus the very purpose of the Foundation would be defeated. Especially would this be true of small businesses, since by accepting research funds from the Government they would sacrifice the rights which would enable them to become established and to expand.

(13) Probably the most influential witness was *Vannevar Bush*, director, Office of Scientific Research and Development (pp. 199–227). He told of the great need for scholarships and fellowships to make up for the deficit of scientists in the United States. He called for Government support of basic research. Without Federal funds to support fundamental research, not only would the pace of scientific discovery diminish, but certain fields of basic research (i.e., military and naval) would fail to receive due attention. He expressed preference for the Magnuson bill, favoring the vesting of power in a board, and was of the view that the Foundation should support research wherever it is found, that such research should not be replaced or controlled by the Federal Government.

As for patent policy, he felt that the patent problem was a subject for separate legislation—separable from the main objectives of both bills.

> The approach of the Magnuson bill, therefore, is sound. That bill leaves the Foundation free to work out such patent arrangements with its research contractors as the particular facts of particular cases may require in the public interest.

He objected to the Kilgore bill because he believed it would deny to the Government, especially in the field of research on national defense, the services of many of the most competent industrial organizations in the country. He said:

> There will be occasions, as there have been in the past, where the scientific experience and facilities urgently required for a vital research project can be found only in a commercial organization. Yet such an organization, as trustee for its stockholders, cannot agree to divert a large portion of its time, its skill and its facilities acquired with stockholders' funds, from its own programs to those of the Government if all of the rights to the inventions created by that time, skill, equipment, and investment are to be forfeited.

He did not believe that if a college purchased equipment with Federal funds, that all of its inventions and discoveries after that time should be the property of the Government. He went on to say:

> The extent of the patent rights to which the Government is entitled depends on all the facts of a specific case. In particular, the patent rights which the Government should acquire depend on the relative degree of the Government's contribution to the particular research project as compared with the contribution of the private organization undertaking that project. Government-supported research is a collaborative proposition. The funds furnished by the Government are not the sole ingredient of successful research. The facilities, the funds, the personnel, and the skill furnished

> by the research organization are indispensable. The terms on which the research is done, must, therefore, be fair to all participants. No person, organization, or government can insist on an all-or-nothing policy for itself and expect to persuade others to collaborate with it effectively. Under the proposal in S. 1297, however, the Foundation would be compelled to contract for research on an all-or-nothing basis with regard to patents.

He went on to say that the contractors should be assured as to patent rights before entering a binding contract. The suggestion that contractors be paid the full value of facilities, experience, and personnel was not the answer, for it would greatly increase the cost of research and force negotiations on a very intangible basis, since no accurate value could be placed on such factcrs. Dr. Bush recommended:

> In most cases, as a policy for the Foundation, the usual provisions of Government research contracts under which the contractor grants a royalty-free license in favor of the Government would seem adequate. Such a license should be granted under all patents covering discoveries or inventions made in the course of research financed by the Foundation.
>
> In addition, it is to be expected that, as a matter of policy, the Foundation would require assignment to the Government of the full patent rights to inventions in the fields of particular importance. Thus, for example, most medical research should be done under arrangements which yield to the Government the full patent rights. Of course, too, it is understood that the information resulting from research financed by the Government would be fully disseminated to the public for its use.

(14) *Hon. Robert P. Patterson*, Secretary of War (pp. 227–242), and (15) *Hon. James V. Forrestal*, Secretary of the Navy (pp. 243–249), both favored including a minimum of 20 percent of the funds for national defense. Mr. Patterson believed in consultation and taking the advice of scientists rather than in a strict one-man control. He thought it advisable to provide for patent matters by separate legislation.

(16) *Rear Adm. Harold G. Bowen*, chief of the Office of Research and Invention (pp. 249–255), and(17) *Comdr. R. L. Chappell* (pp. 255–258), described the patent policy adopted by the Navy and praised its success. They testified that the Navy bargained for only a governmental license and left the commercial rights with the concern that did the research work. The employees, too, were allowed the commercial rights to their patents.

(18) *J. R. Oppenheimer*, director, New Mexico Laboratories, Manhattan project (pp. 297–318), stressed the need for freedom in research and described how stifling useless security restrictions can be to science. He read a statement of Dr. Enrico Fermi who believed the work of the Foundation should be carried out by—

> (*a*) leaving extensive freedom of choice in orienting their research to the scientists themselves; (*b*) not hampering the scientists with secrecy restrictions except in such cases as

would be recognized as appropriate by the scientists themselves; (*c*) trying to make the scientific profession attractive to the young people both in a material way, as, for example, by an extensive program of fellowships, and in a moral way by having them feel that even the most pure scientist fulfills a function of paramount interest to the community.

(19) The only witness to oppose the legislation was *Frank B. Jewett*, President, National Academy of Sciences (pp. 427–447). He did not believe that the Government should interfere with the work of the scientists, and that the traditional channels were adequate for research.

(20) *Karl T. Compton*, president, Massachusetts Institute of Technology (pp. 621–645), told of the great necessity for awarding scholarships and fellowships. He believed that the vesting of authority in a small commission would be both more effective and safer than vesting the final authority in a director. He declared that he preferred S. 1285 because it allowed greater flexibility by the National Research Foundation in handling any patent equities in accordance with requirements of various types of situations which would arise.

(21) *Henry de W. Smyth*, chairman of the Department of Physics, Princeton University (pp. 645–657), and (22) *Harold C. Urey*, University of Chicago (pp. 657–663), told of the great need for research in the fundamental sciences. They told how science needed free exchange of ideas and how it was hampered by security restrictions.

(23) *Howland H. Sargeant*, chief, Division of Patent Administration, Office of the Alien Property Custodian (pp. 675–696), discussed patents. He said:

> Now, I think I would summarize our conclusions rather briefly. (1) We are in complete sympathy with the proposals to create a National Research Foundation. * * *
>
> (2) Our experience in administering patents which have become the property of the U.S. Government leads to the conclusion that it is desirable to define specifically in any legislation that is enacted the broad principles under which the administration of patent rights would be carried on by any agency created to execute a national program for the adequate development of our technical and scientific resources. We believe that will be applicable to such an agency as you are proposing here, as the National Research Foundation.
>
> Our third conclusion is, our own experience leads me to the conclusion that a Government agency will make the most effective use of the patent rights under its control through the adoption of a policy of nonexclusive, royalty-free licensing, which is, in fact, the program the alien property custodian has been carrying on.

(24) *Casper W. Ooms*, Commissioner of Patents (pp. 696–705), also gave his views on patents in the following words:

> I have never been able to understand why the administrative burden of this patent program would be imposed upon the foundation, for obviously the only purpose which the patents procured by the Foundation could serve would be as a policing device to prevent the use of the Foundation's pub-

lished research in an enterprise that might tend to promote violations of the antitrust laws.

The Chairman asked

> Under your theory, then, no patents should be sought at all.

Mr. Ooms replied:

> That is with the exception of those exceptional cases that are related in the further sections of the current draft of the bill, which provides for an escape clause where there are peculiar facilities that are available only if you do make some such provision. For the general work of the Foundation I think patenting would be a mistake.

He supported the principles of S. 1285.

(25) *Paul A. Porter*, Chairman, Federal Communications Commission (pp. 803–817), preferred a single administrator. On the matter of patents, he said:

> It seems to me extremely important that, as this case illustrates, the patentable results of Government research undertaken pursuant to this legislation should not be left to existing patent legislation, which was designed to meet an entirely different type of research situation. Patent provisions should be carefully drawn to meet the particular objectives of Government-sponsored research and especially to insure that delays in the introduction of new technical advances shall not result from multiplicity of patent claims where Government-financed research is involved.

(26) *Philip Murray*, president, CIO, in testimony presented by *Robert K. Lamb*, national legislative representative, United Steelworkers of America, CIO (pp. 857–871), said:

> With regard to patents, the CIO believes that where the taxpayers of the country provide funds for scientific research to promote the general welfare, they should certainly retain control over the byproducts of these expenditures. To give private corporations an exclusive monopoly of the results offends American democratic principles.

He was not in favor of board control.

(27) *Bernard M. Baruch* (pp. 907–923) advocated a broad program of research which would cover many fields. As to patents, he said:

> I believe that the Foundation should be given the greatest flexibility for an initial period, so its members can experiment with various arrangements which will protect the public interest without defeating initiative and imagination. * * * Where the Government foots the entire cost of an experiment, any patentable results should belong to the public rather than any private interest.

(28) *James B. Conant*, president of Harvard University (pp. 977–990), urged favorable action on S. 1285. He advocated a broad program covering various fields. He favored a board administration and agreed with having a national science reserve.

(29) *I. I. Rabi,* Columbia Radiation Laboratory, Columbia University (pp. 990–1001), favored a board administration. As to patents, he told about the policy of Columbia which lets a man patent what he pleases. However, he added, few of the scientists availed themselves of the privilege. They wanted freedom of discussion above all. He believed the Foundation should follow this example of Columbia. Dr. Rabi was opposed to scientists being part of a reserve to be called in times of need. He felt that this reserve would be "just the beginning in which the scientist will be treated as a tool of the Government rather than a man who is devoting his life to trying to understand the laws of nature and increase our knowledge of nature."

(30) *Morris L. Cooke,* consulting engineer in management, representing the Independent Citizens Committee of the Arts, Sciences, and Professions (pp. 1001–1009), expressed the views for this group. He recommended vesting powers in a director, but that "both the director and the board members be subject to Senate confirmation." As to patents, he said:

> Our organization believes that the patent provisions of the Kilgore bill, S. 1297, should be approved, with specific modifications in relation to existing laws. For myself, * * * whatever of value—patents or anything else—which results from the expenditure of Government funds should become the property of the Government.

(31) *Miscellaneous witnesses*

Representatives of the medical profession and representatives in the fields of zoology, botany, agriculture, etc., presented their views. They all favored establishment of this Foundation, and told how their particular fields could be benefited.

A panel of engineers (pp. 705–730) presented views favoring establishing the National Research Foundation.

Witnesses in the social sciences, political sciences, etc. (pp. 737–801), presented their views favoring inclusion of the social sciences in the National Research Foundation.

Five chemists, technicians, and a director of research (pp. 817–855) all favored a National Research Foundation. Four were in favor of the patent policies of S. 1285, and one in favor of the Government getting the patents.

Other scientists, educators, and industrialists presented their views on the proposed legislation. Scholarships and fellowships were considered by all these witnesses to be of utmost importance. Testimony of high school students who were finalists in the science talent search told how they might benefit from a National Science Foundation.

3. ACTION TAKEN—SENATE

a. Majority report on S. 1850

Senate Report No. 1136 from this committee (Military Affairs) reported out a compromise bill, S. 1850, on April 9, 1946. Important or controversial points were reconciled as follows:

Under S. 1850 the National Science Foundation would be headed by an Administrator, appointed by the President, by and with the advice and consent of the Senate. The Administrator would have

the benefit of an advisory board, also appointed by the President, consisting of experts serving on a part-time basis.

S. 1850 provided for allocation of funds to the several States, on a basis which assured that at least 25 percent of all funds administered by the agency would be distributed among the several States on an equitable geographic basis.

The committee rejected the proposal that the social sciences be specifically excluded from support by the new agency, because of the demonstrated interdependence of the physical and social sciences. S. 1850, however, endeavored to assure that all social studies supported by the Foundation would be scientific in character.

S. 1850 established a central register of all inventions, discoveries, patents, etc. Each organization contracting for Government research should make available to the Federal agency all discoveries and inventions produced in the course of the research. It also provided that all inventions in which the Government or any Government agency held any rights, including patent rights, should be made available on a nonexclusive, royalty-free basis. However, the bill provided protection for the commercial rights of private organizations or individuals who had contributed substantially to a particular development partially financed by Federal funds.

As for the report as a whole, Senator Kilgore, as chairman, stressed the following points: the need for legislation, the need for research in basic sciences, the shortage of scientific personnel, the financial support of American science, the scope of basic science to be supported (including social sciences), scholarships and fellowships, national defense, and medical science.

Stressing the need for free communication of information, he said:

> In making available the results of federally financed research, provision must be included not only for publication of scientific data, but also for the availability of patentable discoveries. It seems axiomatic that when the research is fully financed by Federal funds, the results of this research should be made available on a nondiscriminatory basis to all possible users. * * * The bill now being recommended contains no provision for the modification of existing patent laws or the right of any individual or corporation to patent, hold, transfer, or exploit privately developed inventions.

The report took the view that where a private organization had contributed substantially to a particular invention, it might retain such portion of commercial rights as the parties agreed was equitable. The committee recommended minimum safeguards which would assure that the results of discoveries financed by the Government would be made fully and freely available to the public.

b. Minority report

The minority views of Senator Bridges were presented in part II. He said:

> We do not oppose Federal financial aid to those engaged in scientific research but we do oppose Government control and direction of research in the fields of science. Such con-

trol will, we believe, stultify progress in research rather than aid it.

The minority report maintained that too much power would accrue to the Administrator and that the patent system would be jeopardized:

> Obviously, the Administrator, under the provisions of the bill, will become one of the most powerful men in the Government and in the country. The bill proposes to add another large agency to the Government structure. Another large sector of our national economy would come under the centralization, control, and supervision of Washington. Another field of State responsibility—education and learning—would be brought under the domination of the Federal Government. Another huge expenditure of $200 million to $300 million per year would be added to our already dangerously unbalanced budget.
>
> * * * * *
>
> Today our educational institutions are proud of their independence and freedom. If in a few years they become dependent upon funds from the Federal Government (funds over which they have no control) they will not be able to resist the authority for dictation of this czar of science—the Administrator. Only those schools capable of satisfying one man will receive the Federal money.
>
> The extreme lack of flexibility in the provisions of the bill is indicated by the fact that over 65 percent of the funds appropriated are allocated in mutually exclusive classifications, each intended to buy the support of some section of our economy.
>
> Under the guise of protection for Federal money, the bill contains basic reforms in the patent laws which are in conflict with the purpose of the Constitution and that tend to eliminate the private patent system.
>
> Research and development are defined by section 12(a) to cover not only basic and theoretical exploration in science but to extend to the experimental production and testing of models and processes. Thus, the foundation may finance development to the ultimate production.
>
> * * * * *
>
> The summary of the cost of the program indicates the size of the expenditure contemplated and the extreme controls on the use of the appropriated funds. It also illustrates the thinking of those who have operated this Government for many years on an unbalanced budget and placed the citizens of the country under the largest financial debt in history.

Other objections voiced by the minority report included the following: (1) The inventor would suffer under this bill by not enjoying patent privileges; (2) if the bill passes, the Patent Act of 1883's provisions for protection of Federal employees would be in jeopardy; (3) validity of contracts would be impaired; and (4) it might leave a dangerous opening in our security laws.

c. Debates and action in Senate

S. 1850 was debated in the Senate on July 1 and 2, 1946.[47] Senator Kilgore, defending the bill, said that industry was unable to undertake much basic research, since such research could show no direct profit. The United States is a leader in applied research, but he warned against believing that industry could take care of basic research. He declared that the Nation's strength depended on the strength of its scientific resources. He gave examples of efforts that had been wasted and of retarded development because there was no agency such as the one proposed in S. 1850. He said that the Foundation was not a research organization within itself, but would support and initiate research in existing institutions.

In answer to a question by Senator Hart, Senator Kilgore explained that the recipients of scholarships and fellowships would be under no obligation to the Government.

The question of the type of administration came up. Senator H. Alexander Smith preferred a board control. He said that the scientists feel that "they are to be hidebound and governed by someone in Washington who can tell them what the area of their research shall be."

He proposed an amendment substituting "board" for "administrator." This was rejected.

Senator Smith also objected to the State-by-State distribution of funds. He said that the purpose was to support basic research, and that we might not find it in every State. He thought that scattering would cause second- and third-rate results. Senator Kilgore responded that good men were found in the smallest institutions, to which Senator Smith replied that we would not have to subsidize every State and every institution to get those few stars. He presented an amendment to this effect. It was also rejected.

Senator Smith proposed an amendment striking out the entire section 8, which comprised five or six pages of detailed regulations with regard to patents. He proposed substituting a simple section 8, saying that the patent rights in inventions should be disposed of in a manner consistent with the public interest. This amendment was also rejected.

Senator Hart argued against including social sciences. He presented an amendment to this effect, and it was agreed to. He also asked for an amendment striking out giving scholarships and restricting grants to fellowships. This amendment was rejected.

S. 1850 was passed on July 3, 1946, by 48 yeas, 18 nays, and 30 not voting. On July 5, 1946, the bill was referred to the House Committee on Interstate and Foreign Commerce, but due to the impending end of the session was not reported out of committee.

4. H.R. 6448, MAY 15, 1946 (MR. MILLS)

a. Provisions

Important provisions in H.R. 6448 included the following:

(1) Direction. Powers were vested in a board, which would prescribe the powers and duties of a director.

[47] 92 Congressional Record, pp. 8026-8205.

(2) Information and Inventions. Provided that each contract contain its own provisions for disposition of inventions, in a manner calculated to protect the public interest and the equities of the individual or organization with which the contract is executed. "Such objectives might usually be accomplished, within the discretion of the Foundation in particular cases, by making freely available to the public, or, if patented, by freely dedicating to the public, inventions produced in the course of basic or fundamental scientific research * * *"

b. Hearings and significant testimony

Hearings on H.R. 6448 were held before a House subcommittee of the Committee on Interstate and Foreign Commerce, on May 28 and 29, 1946. Testimony included the following:

(1) *Representative Wilbur D. Mills* (pp. 15–24) told of the benefits of the bill. He pointed out four fundamental differences between it and S. 1850. Two of these, he described as follows:

> First, the Kilgore-Magnuson bill vests power in a single Administrator. H.R. 6448 vests all powers of decision in a board of nine members.
>
> The second major difference between the two bills is in the handling of patents. The Kilgore-Magnuson bill contains five pages of complicated and detailed patent provisions that are made applicable to the scientific work of all Government agencies rather than just the Foundation. In general, the policy set forth in that bill is for all Government agencies to obtain title to all inventions made during the course of federally supported research and development except in cases in which detailed findings to the contrary are made by the Government agency concerned. In my opinion those provisions impose an undue administrative burden on Government agencies and fail to recognize that the problems of all agencies conducting scientific activities are not identical. Also, I think that those provisions fail to recognize in an appropriate way the equities of commercial organizations and educational institutions with which the Government does business. On the other hand, H.R. 6448 contains patent provisions that are relatively short and apply only to the work of the Foundation and not to all Government agencies * * *

The Mills bill, he added, stated broad objectives only, to wit, adequate protection of the public interest and the equities of individuals or organizations, with the Foundation given a great deal of discretion in determining how those objectives might best be achieved. It provided that inventions made by employees of the Foundation during the course of their assigned activities, should be dedicated to the public. On this point, Representative Mills added:

> The purpose of such a provision is to give assurance to organizations with which the Foundation does business that they may safely confide the results of their research and development activities to employees of the Foundation without fear that their ideas might become the basis for patent applications by the employee for his personal profit.

The third difference, he continued, is in the provisions with respect to the distribution of funds appropriated to the Foundation. The Kilgore-Magnuson bill prescribed rather strictly the type of distribution allowed, whereas H.R. 6448 gives much greater latitude to the officials of the Foundation in determining which organizations should receive contracts.

The fourth and last major difference between the two bills concerns support of the social sciences. The Kilgore-Magnuson bill provided for initial establishment of a Division of Social Sciences, etc., whereas H.R. 6448 leaves the question to be decided at a later date.

(2) *Hon. Robert P. Patterson,* Secretary of War (pp. 24–31), said in regard to patents:

> I have given careful consideration to the features of H.R. 6448 which deal with patents. I find that since they are not retroactive and apply only to contracts executed in the future, they are satisfactory to the War Department. Insofar as they relate to contracts, they represent current War Department policy and permit a determination of the proper rights to be obtained in each individual case, and maintain the equities of the general public and those of the organization with which the contract is executed.

He approved provisions giving patents to the Government for work completely financed by the Foundation, and making information available to the general public, but giving the patents to the contractor when he has contributed substantially through past or current research activities.

(3) *Edward U. Condon,* Director of the National Bureau of Standards, Department of Commerce (pp. 75–89) read a statement by Henry A. Wallace favoring the provisions of S. 1850. He preferred an administrator to a board, believed the social sciences should be included, and was opposed to allowing private patents on discoveries resulting from research financed by public funds.

(4) *Miscellaneous witnesses*

Most of the witnesses thought that H.R. 6448 was a well-drawn piece of legislation. Those who especially favored the type of administration (a board rather than a director) and the patent provisions of H.R. 6448 as opposed to S. 1850, were—

Dr. C. E. MacQuigg, representing the Engineering College Research Association (pp. 31–33).

W. John Kenney, Assistant Secretary of the Navy (pp. 41–46).

Vannevar Bush, president, Carnegie Institution of Washington, and director of Office of Scientific Research and Development (pp. 47–55).

Homer W. Smith, professor of physiology, New York University College of Medicine (pp. 55–59).

John F. Victory, executive secretary of the National Advisory Committee for Aeronautics (pp. 61–64).

George E. Folk, representing the National Association of Manufacturers (pp. 65–68).

Detlev Bronk, director, Johnson Research Foundation (pp. 68–72).

Rev. J. Hugh O'Donnell, C.S.C., president of Notre Dame University (pp. 89–94).

c. Action

No further legislative action was taken on H.R. 6448 or S. 1850. Thus, all bills on a National Science Foundation died at the end of the session.

D. 80TH CONGRESS, 1ST SESSION

1. IMPORTANT BILLS INTRODUCED—HOUSE OF REPRESENTATIVES

a. H.R. 942, January 14, 1947 (Mr. Celler)

(1) Direction. The organization to be headed by an Administrator appointed by the President.

(2) Information and inventions. Each contract for federally financed research entered into by any Government agency should provide that all data on inventions and patents produced in the course of such research be made available to such agency, which in turn should make such information available to the Administrator. All inventions and patents in which the United States holds any rights should be made available on a nonexclusive and royalty-free basis. Inventions and patents produced in the course of federally financed research should be dedicated to the public, unless retention of invention and patent rights was specifically provided for in the contract with the private organization.

b. H.R. 1815, February 10, 1947 (Mr. Case)

(1) Direction. The organization to be composed of 48 members appointed by the President, who would elect 9 members to form an executive committee. The executive committee would appoint a Director.

(2) Information and inventions. Each contract for federally financed research executed by the Foundation should contain provisions governing disposition of inventions produced thereunder in a manner calculated to protect the public interest and the equities of contractors. Inventions produced by employees of the Foundation should be made freely available to the public.

c. H.R. 1830, February 10, 1947 (Mr. Mills); H.R. 1834, February 10, 1947 (Mr. Priest); H.R. 2027, February 18, 1947 (Mr. Hays)

These bills were identical to H.R. 1815.

d. H.R. 4102, July 8, 1947 (Mr. Wolverton)

This bill was reported out of the House committee, after consideration of the above-mentioned bills. It followed the lines of H.R. 1815 and the identical bills.

(1) Direction. Powers were to be vested in a Board of nine, who would appoint a Director who would be responsible to the Board.

(2) Information and inventions. Each contract should contain provisions, consistent with the laws affecting the issuance or use of patents, governing the disposition of inventions produced thereunder in a manner calculated to protect the public interest.

2. HEARINGS AND SIGNIFICANT TESTIMONY—HOUSE OF REPRESENTATIVES

Hearings were held before the House Committee on Interstate and Foreign Commerce on March 6 and 7, 1947.

a. Specific witnesses

(1) *Representative Charles A. Wolverton,* chairman, opened the hearings, pointing out that all groups agreed as to the need for the legislation, and the question to be settled was the matter of the form it should have.

(2) *Representative Emanuel Celler* (pp. 23–27) discussed particulars of his bill. In the administration and organization of the Foundation, H.R. 942 provided that it be headed by a single Administrator appointed by the President with the approval of the Senate, who would be responsible directly to the President and through him to the Congress. As for the inclusion of social sciences, he said that the physical sciences were far more advanced than our ability to organize ourselves socially. As for the distribution of 25 percent of all research funds on the basis of State quotas, he said that States would be able to share effectively in work if, from the beginning, this portion were distributed equally. And, as for the full and free publication of the results of federally financed research he believed that wherever the public put up the money for a research project the results, including patents, should either be freely available to all users or, if controlled, should be controlled by a public agency.

(3) *Hon. Robert P. Patterson,* Secretary of War (pp. 27–36), explained his preference for the four identical bills. As to administration—

> * * * I would give great weight to what the leading scientists familiar with organizations of this type would say would work best * * * By their achievements during the war, they have shown, the leaders of them, a great skill and ability and competency in organization and not just theorists or laboratory people, but a high degree of statesmanship as well.

Concerning patents, he said:

> * * * these bills should not in any way interfere with the existing patent laws. If there is to be legislation on the patent question, it should be entirely apart from the establishment of a National Science Foundation.

(4) *Edmund E. Day,* president of Cornell University, chairman of Intersociety Committee on Science Foundation Legislation (pp. 49–68), spoke for his committee, saying that a National Science Foundation was of utmost importance. Emphasis should be on fundamental research rather than applied science. He advocated administrative freedom, the type of administration which would give the largest measure of discretion. The caliber of men chosen to direct the Foundation would be most important.

In regard to patent provisions, he said that there had to be some assurance that money poured into the early stages of the development

could be drawn out with profit, especially where development is left to private enterprise.

> The complaint of those who think that some of the proposals with respect to patents overshoot the mark is that they are going to make it impossible for private enterprise to operate on the proposed terms.

He presented the following intersociety committee findings: 63 percent were for a single administrator; 18 percent for a 48-man commission; 48 percent prefer inclusion of social sciences; 86 percent believe in granting undergraduate scholarships; 94 percent believe no special stand should be taken on patent legislation.

(5) *Charles E. MacQuigg*, director of the Engineering Experiment Station of Ohio State University and chairman of Ohio Water Resources Board (pp. 68–73), declared that his group favored a board and favored scholarships. He believed that research should be on the widest geographical basis and that social sciences should not be mixed in the same legislation.

(6) *Frank Jewett*, President, National Academy of Sciences (pp. 73–111), speaking for himself, was opposed to Federal support. He believed the traditional channels were good enough.

> So on two scores I am skeptical: First, as to the premise on which the necessity for this foundation scheme is based, and, in the second place, I am very doubtful as to whether the people of the United States, for the money which is spent in this particular sector, will get as much value out of their dollars as they would get were they in a position to make the expenditures directly in the traditional way.

(7) *William A. Higinbotham*, executive secretary of the Federation of American Scientists (pp. 111–119), said that:

> Science foundation legislation should have two primary objectives:
> First, to make sure that scientifically inclined American youth have an opportunity to develop their talents; and
> Second, to support and extend basic scientific research.

(8) *George E. Folk*, special adviser to the National Association of Manufacturers committee on research and patents (pp. 123–134), said that the NAM approved legislation along the lines of Dr. Bush's report.

> The NAM favors in principle legislation for creating a National Science Foundation along the lines recommended by Dr. Vannevar Bush in his report entitled "Science, the Endless Frontier." It believes that the Foundation should have certain characteristics found in the four identical bills, H.R. 1815, 1830, 1834, 2027. Those features especially approved are—
>
> (1) A relatively simple organization consisting of persons well versed in the specified fields which are included in the Foundation's activities.
>
> (2) The selection of such members of the Foundation solely on the basis of established records of distinguished service.

(3) That in the selection of members of the Foundation due consideration shall be given to recommendations for nominations made by the National Academy of Science or by other scientific organizations.

(4) That the chief executive officer of the Foundation, shall be a director selected by an executive committee of that Foundation which shall prescribe the powers and duties of the Director and which powers and duties shall be performed under the supervision of the committee.

There are certain provisions of these four bills which are open to adverse criticism. They are—

(1) Including among the possible membership of the Foundation those qualifying merely as leaders in "educational or public affairs."

(2) Including "educational organizations," merely as such, among those organizations whose nominations must be given due consideration.

(3) The inclusions of "other sciences" as fields in which the Foundation is authorized to initiate and support scientific research.

(4) The broad inclusion of "personal property of all kinds," which would include patents, as subject to condemnation by the Foundation even where such patents results from research by independent inventors.

(5) The indefiniteness in section 11(b) of the phrase "if patented" since the inventions may be patented either in the United States or in foreign countries or in both.

(6) In making it possible to ignore the civil service laws in the appointment of permanent employees of the Foundation.

Turning now to the Celler bill, H.R. 942, which is identical with the Kilgore bill, S. 1850 * * * the NAM cannot view H.R. 942 with approval since it departs to such an extent from the original concepts of what was deemed necessary to carry out the fine objectives of Dr. Vannevar Bush. This is because the new measure contemplates—

(1) A large organization imposed, in part, upon advisory boards—a large organization which has implications of political patronage.

(2) A board of scientists with only advisory powers and without authority which would not attract top scientists of the country.

(3) Giving the President of the United States very broad powers, under which he could, if he so desired, interpret the broad objectives of the bill as he wished.

The political implications of this and the possible danger to the school system, science, business, and our economic system in general are obvious.

(4) The danger of channeling research through the determination by a director of this important body of what in his estimation should or should not be undertaken, for, as the Rev. J. Hugh O'Donnell, President of the University of Notre Dame, has so well stated:

"These men (scientists) have a natural—and historically by no means groundless—apprehension that Federal subsidy can be a serious threat to the academic independence that higher education has always guarded so jealously."

(5) A formula for the distribution of research funds which is unduly restrictive.

(6) Patent provisions which do not belong in a measure of this nature.

(7) Patent provisions which because of their nature virtually might confiscate a form of private property.

(8) Patent provisions which because of their complex language provide much uncertainty as to what the law might be.

(9) Patent provisions which because of their tenor might well tend to discourage rather than encourage private initiative.

The reasons for approving certain features and disapproving others, as above enumerated, are set forth in our main statement.

(9) *William C. Foster*, Under Secretary of Commerce (pp. 171–177), declared:

In my opinion there is no question that the basic principle of the single administrator advocated by President Truman represents the only sound public policy. On the question of patent policy all the bills before you are in agreement that no employee of the Foundation shall be permitted to profit personally by taking out private patents on discoveries arising in the course of his employment with the Foundation * * *.

* * * I suggest that the question of broad patent policy on research contracts be omitted from this bill so as to expedite its consideration and passage; and that Government-wide patent policy be considered as a separate problem.

(10) *Randolph T. Major*, director of research and development, Merck & Co. (pp. 177–181), supported establishment of a Foundation as proposed in the four bills, but did not favor enactment of the Celler bill. He preferred a board to a single administrator. He disapproved the inclusion of social sciences. As for the patent provisions, he said:

I think that it would be particularly undesirable to tack on to the Science Foundation bill a rider proposing to make drastic changes in the patent policies of all Government agencies as is attempted in the Celler bill (H.R. 942).

(11) *Robert M. Yerkes*, emeritus professor of psychobiology, Yale University, chairman of Committee on the Federal Government and Research, Social Science Research Council (pp. 182–191), gave reasons why the Foundation would need a broad scope. He listed some of the important issues to be studied as follows:

(1) Labor-management relations—problems of man versus machine in a highly industrialized free-enterprise system;
(2) population control—quantity, migrations, immigration;
(3) taxation—which bristles with social and other biological

problems; (4) foreign relations, likewise primarily dependent on human factors; (5) world trade relations; (6) budget, debt, and financial policy; (7) national defense, security, and welfare.

(12) *Thorndike Saville*, representing the Engineering College Research Council of the American Society for Engineering Education (pp. 191–200), said that:

> The Engineering College Research Council is in general sympathy with the provisions of H.R. 942 of the present Congress, which is nearly identical with the old S. 1850.

As for organization he recommended that—

> a board of nine members be appointed by the President upon nomination of one or two persons from each of several competent scientific and engineering organizations.

He opposed including social sciences.

(13) *Hon. James Forrestal*, Secretary of the Navy (pp. 200–206), in a statement read by P. F. Lee, emphasized the importance of establishing the Foundation in order to coordinate research. He preferred a board, and said about patents:

> I am in favor of the type of bill that leaves the Foundation free to establish its own set of rules regarding the administration of such patents as may arise as an incident to its operations. I object strenuously to some of the patent provisions of H.R. 942—not only because they are poor rules for the operation of a science foundation, but also because they would apply to all agencies of Government.

Admiral Lee thought the Foundation should be limited to basic research as far as possible and not include social sciences.

(14) *Bruce K. Brown*, vice president in charge of development for Standard Oil Co. (Indiana) (pp. 215–224), preferred the four bills over the Celler bill. He said:

> It is my considered opinion that the patent provisions of H.R. 942, requiring as they do a dedication to the public of all patents and inventions made in the course of federally financed research would make it difficult, if not impossible, for the Government to place many important research contracts, and would seriously impede and imperil the Navy's own research program.

Pure research, he maintained, does not lead to patents. Speaking of the Celler bill:

> We could not have won the battle of production prior to and during World War II with patent rules like that. No research group, industrial, university, or institutional, could accept any sort of a grant-in-aid of any project from any Bureau of the Federal Government without risking patent domination by Government henceforth.
>
> The provision requiring the university to license all applicants is an attempt to impose a compulsory licensing system

on only a part of our national economy, although all efforts to write such provisions in the patent law itself have properly failed.

He said that the Government should have the right to use inventions free of patent claim, and should have patent rights for projects starting from scratch under Government auspices. He presented a letter from R. Morton Adams, president, New York Patent Law Association, disapproving the Celler bill.

(15) *John F. Victory*, executive secretary, National Advisory Committee for Aeronautics (pp. 224–230), declared as to administration:

> I believe that the committee-over-director form of organization has, in the NACA, been successful to a degree which would not have been attained had our director of aeronautical research been free to ignore what would have been merely the "advice" of his board of directors.

He stressed the importance of scholarships.

(16) *Vannevar Bush*, president of Carnegie Institution of Washington, chairman of the Joint Army-Navy Research Board, and Director of the Office of Scientific Research and Development (pp. 231–254), said:

> Now, both bills have many desirable objectives in common. They both establish a National Science Foundation as an independent agency. They both provide that the Foundation should support basic research. They both provide that, with respect to matters affecting the national defense, the Foundation may not only support basic research, but also perform applied research and development. They both provide for the award of scholarships and fellowships in science, to young men and women of outstanding ability, and neither bill attempts to limit the recipients to any particular field of scientific study, nor to retain any control over them after completion of their studies. Both bills contemplate an internal structure for the Foundation composed of divisions, each of which is to be concerned with a major field of science, and in addition, a Division of Scientific Personnel and Education. Moreover, they both permit additional divisions to be established when necessary or desirable. Both bills provide for an advisory committee of specialists to be attached to each division. Both bills provide for correlation of existing Government research and for fostering the interchange of scientific information, both domestically and internationally.

On differences between the bills, he said:

> The most important of these differences is the focus of ultimate authority and responsibility within the Foundation. H.R. 942 vests this authority and responsibility in a single administrator who would act with the advice of a part-time board. On the other hand, under H.R. 1830 the Foundation would be headed by a board of outstanding men, which in turn, would appoint an administrator to carry out its policies and to handle the administration affairs of the agency.

He preferred the Board and discussed his reasons for this preference. On patentable inventions he said:

> Now, the two bills are very different in their treatment of inventions made in the course of research supported by the Foundation. H.R. 1830 directs the Foundation, in making contracts and other arrangements for research, to consider the public interest and the equities of the research organizations and individuals with which it deals. It further provides, however, that no officer or employee of the Foundation shall derive any personal benefit from inventions which may be made by him in the course of performing his assigned activities for the Foundation. This, I believe, is as far as this legislation should go in controlling the policies of the Foundation. I believe that an able director, guided by this directive and by more detailed policies which would be established by the Foundation, would protect the public interest and, at the same time be fair to the individuals and organizations which will be performing research for the Foundation.

He considered scholarships and fellowships to be the most important part of the bill. He did not believe in including social sciences.

(17) *Lewis G. Hines*, national legislative representative of the A.F. of L. (pp. 255–56), urged favorable action on H.R. 1815 and identical bills. He was in favor of the inclusion of social sciences. As for patents, he said, "Use of public funds for research must be accompanied by safeguards to assure use in the public interest." Patents covering inventions and discoveries should belong to the agency financing the research. In Government ownership, full information should be made available to all with opportunity for nonexclusive license.

(18) A written statement was prepared by a *Panel of Appointees of the National Engineering Societies* (pp. 273–277). They believed that the primary purpose should be basic research, not applied. They also believed that no useful purpose was served by including the social sciences; that the Director should be under the general control of the Board; that there was need for scholarships; and that:

> If the Foundation is properly set up for the object of advancing basic sciences, the question of patents will not be serious, and in rare, exceptional instances could be properly handled under the provisions of the general patent law through appropriate contractual relationships determined by the Board.

3. ACTION TAKEN—HOUSE OF REPRESENTATIVES

a. Reports

H.R. 4102 was reported out by the Committee on Interstate and Foreign Commerce on July 10, 1947 (H. Rept. 864). It was made special order (H. Res. 289) and was reported out in H. Rept. 903.

b. Debates in Congress

On July 16, 1947, the House debated H.R. 4102 (Congressional Record, pp. 9060–9095).

Mr. Wolverton warned of the dangers in the shortage of skilled scientists, especially in the field of basic research. He said that the committee had concluded that the enlargement of the reservoir of scientists could not be accomplished without the Federal scholarship and fellowship program and it was in the interest of the Nation's welfare and security that positive steps be taken by the Federal Government to eliminate the current deficit in trained scientists.

Representatives Brown (Ohio), Sabath, and Stevenson all presented views favoring the establishment of the National Science Foundation.

Mr. Hugh D. Scott, Jr., offered an amendment striking out all after the enacting clause and inserting income tax benefits for those who had made essential contribution to fundamental research in the sciences. A point of order made by Mr. Hinshaw was sustained. Mr. Hale supported the amendment of Mr. Scott. He recognized the importance of science, but did not believe it could be helped by being "bureaucratized." He believed science could be helped by private contributions, which would come about through a change in tax laws.

Mr. Robertson offered an amendment apportioning 25 percent of the funds for research activities equally among the States; two-fifths to be apportioned among the States in equal shares and the remainder among the States in proportion to their population. The amendment was rejected.

Mr. Wolverton offered an amendment to strike out all after the enacting clause of the bill, S. 526 (see infra, pp. 59–62) and insert in lieu thereof the provisions of the bill H.R. 4102. This amendment was agreed to.

S. 526, with Mr. Wolverton's amendments, was passed by the House on July 16, 1947.

4. IMPORTANT BILLS INTRODUCED—SENATE

a. S. 525, February 7, 1947 (Mr. Thomas)

S. 525 followed the lines of the bills favoring an Administrator to be appointed by the President, 25 percent of the funds to be apportioned among the States, Government licensing of patents, and the inclusion of the social sciences.

b. S. 526, February 7, 1947 (Messrs. Smith, Cordon, Revercomb, Saltonstall, Magnuson, and Fulbright)

As introduced, S. 526 favored vesting power in a Board, did not strictly apportion the funds among the states, provided for operation within the existing patent practices of the Government, and did not include the social sciences.

c. Reports

The Senate Committee on Labor and Public Welfare reported out S. 526 (S. Rept. 78) on March 26, 1947. The committee amended the bill as submitted in the Senate, but none of the essential features were changed. The committee found that S. 526 could accomplish the purposes of the legislation in a more democratic and less costly manner than S. 525.

d. S. 526—Debates in Congress and conference report

The debates in the Senate were very extensive, lasting 5 days, to wit, May 14, 15, 16, 19, and 20, 1947 (Congressional Record, pp. 5248–5260, 5324–5346, 5399–5481, 5498–5512).

Mr. Kilgore made an eloquent plea for passage of science legislation. In regard to patent provisions, he said:

> We have had a rather backward view of research. It has been purely commercial, dollar conscious, nickel conscious, penny conscious. We led the world in applied research and applied engineering; but we have taken from others—from Germany, from England, from France, and from Italy—the basic ideas. We talk about the atomic bomb. The principle of atomic fission was discovered long ago. We made a spectacular application of it. The people of the United States think that we have the secret of the atomic bomb, but actually its basic principles were discovered in Europe originally, and other principles far in advance of those may be discovered any day abroad and the application which we have made may become obsolete. This is best illustrated by the fact that one of the principal questions in connection with this bill is that of dollar application. The theory of the bill, as it now rests, is that it is a bill for scientists. I do not say, to produce scientists; I say, for scientists. It is a bill for patents? What are patents? Patents are property; they are property rights in the things that are developed. But the minute the U.S. Government undertakes to apply to inventions the same principles that are applied by every commercial company in the United States, hands are thrown up in holy horror, and it is said that the people, as stockholders in the corporation, should not apply those principles, that, if they do, they cannot get to work for them such scientists as those who work for companies X, Y, and Z.

As for education in basic research Mr. Kilgore said:

> Today we find ourselves at a blossoming period in the United States, devoid of most of our scientific students except those who were rated under a IV–F classification, those who are taking advantage of the GI bill of rights, and some who are endeavoring with their own private funds to get an education. We have lost at least 5 years, and we were woefully behind even before we lost those years. We were not keeping abreast of research. That is plainly evidenced by the fact that the country could afford to go into applied research only in the case of engineering work. Let me give

the Senate an example. Penicillin was discovered in England long years before it was ever used in this country. We conducted applied research which produced a commercial method of manufacture. But all research has been dominated by one thing—commercialism, the dollar value. That is one thing we should get away from if we can, if we expect to progress. We have bought basic ideas from Germany, and in the buying of them we have surrendered our rights by entering into cartels. We have bought them from England, France, and Italy, and then we have gone ahead with engineering and merely applied them. They will return great benefits to us if we properly apply them, if we give to the young men and women of inquisitive and scientific minds a chance to get an education, if we encourage them to forge ahead and to advance into the unexplored fields of science, the great unknown. Dr. Bush called it the great frontier. No frontier can be adequately maintained unless we have a sufficient number of people to explore it, guard it, protect it, and to advance along the frontier when opportunity demands. Science is the great frontier, but unfortunately we have gone ahead only in those fields which paid dollar dividends. We have spent millions of dollars in discovering a new enamel for refrigerators that will not stain. I think it was the General Motors Corp. which devoted 12 months' time in research because an atmospheric condition in Baltimore caused the enamel on a refrigerator to stain. At the same time no effort was made to do certain other things which might have been done. I do not blame GMC. They are in business for money, and they must take care of themselves. We in the Government are interested in the welfare of all the people, and for that reason we must develop scientists and take care of them.

As for the administration, Mr. Kilgore said:

So, Mr. President, the question of administration is important, because the previous, "part-time" administrations have failed, except in time of war. In time of war men will give their time to their Government, and gladly give it, but in time of peace it is different. It is hard to get men who will devote the time necessary to enable them to go into the most minute details of operating an organization of the size and of the national importance of the proposed Foundation.

Russia has set up a program by which in 5 years she hopes to overshadow the rest of the world in the development of scientists, under a foundation which makes provision for sending potential scientists to school. If we would keep our place in the sun, we cannot depend on the basic research of Germany as we have in the past, we cannot afford to have our business and our defense efforts stultified by being compelled to buy their second-hand manufacturing licenses under their patents. We have to find new methods, new things, new men, and we have to develop the men who can function efficiently in this Nation.

> As I said before, the scientists in colleges and universities have their work cut out for them. They are 7-day-a-week men. The scientists in the large laboratories, except the executive types, have their work cut out for them, and one of their first tasks is to see that their laboratories do not get into a jam by losing any patent rights.

Much discussion took place on the need for scientists, and many amendments were presented to S. 526. Two important amendments agreed to were (1) Mr. Morse's amendment that not less than 25 percent of the research activities be apportioned among the States—two-fifths to be apportioned among the States in equal shares, and the remainder in proportion to the States' population, and (2) Mr. Magnuson's amendment that the Director be subject to the supervision and control of the executive committee, but that he be appointed by the President.

Some of the amendments that were rejected were (1) Mr. Kilgore's amendment that mandatory amounts be distributed to the various States; (2) Mr. Kilgore's amendment that patents should be freely dedicated to the public and that the Government should obtain patent rights on research financed by the Government; and (3) Mr. Fulbright's amendment to include the social sciences.

S. 526 passed the Senate on May 20, 1947, by a vote of 79 to 8.

On July 21, 1946, a conference report (H. Rept. 1020) reconciled the differences between the Senate and the House bills. The basic provisions of the House bill were retained. This conference report was submitted in both Houses and agreed to.

e. Presidential veto of S. 526

President Truman stated in a memorandum of August 6, 1947, that he had vetoed the bill with great reluctance for he was convinced of the urgent need for the establishment of a National Science Foundation, but he felt that the bill passed by Congress vested the determination of vital national policies and the expenditure of large public funds in a group of individuals who would be essentially private citizens. This, the President stated, was a marked departure from the sound principles for the administration of public affairs, a departure to which he could not give his approval.

E. 80TH CONGRESS, 2D SESSION (1948)

1. IMPORTANT BILLS INTRODUCED

a. H.R. 6007, March 25, 1948 (Mr. Wolverton)

H.R. 6007 provided for a Director to be appointed by the President who would act in accordance with rules prescribed by an executive committee. It provided that each contract should contain provisions for disposition of inventions. Funds were to be distributed solely on the basis of ability with no provision for 25 percent distribution throughout the States. There was no provision for inclusion of the social sciences.

b. S. 2385, March 25, 1948 (Messrs. Smith, Cordon, Revercomb, Saltonstall, Thomas (Utah), Kilgore, Magnuson, and Fulbright)

S. 2385 did not clearly define the role and authority of the Director or the Board. There was no provision for a percentage distribution of funds. It provided that each contract should contain provisions for disposition of inventions. There was no provision for inclusion of the social sciences.

c. Other bills (H.R. 6238 and H.R. 4852)

H.R. 6238, April 14, 1948 (Mr. Van Zandt), was identical to H.R 6007. H.R. 4852, January 6, 1948 (Mr. Priest), was similar to S. 526, passed and vetoed the previous session.

2. HEARINGS AND SIGNIFICANT TESTIMONY

Hearings were held on June 1, 1948, before the House Committee on Interstate and Foreign Commerce on H.R. 6007 and S. 2385.

a. Specific witnesses

(1) *Vannevar Bush* (pp. 15–16) expressed gratification that the final issue in controversy—the form of organization of the Foundation—had been resolved to the satisfaction of the principal groups concerned. He found the organization proposed by H.R. 6007 to be sound and workable.

He said:

> It would assure full responsibility of the Foundation to the President on those administrative matters which are properly the function of the Executive. At the same time, real authority is matched with responsibility in a representative group of scientists with respect to matters involving scientific evaluation and basic policies.

(2) *Lawrence R. Hafstad*, executive secretary of the Research and Development Board (pp. 29–45), described the need for basic research in the field of guided missiles and other military research. He agreed with Dr. Bush on the administration. Although he stressed the utmost importance of basic research, he objected to wording that would limit the organization to basic research only, since there might be occasions (emergency, etc.) where it would be desirable to carry on applied research, too.

(3) *Hugh Wolfe*, representing the Federation of American Scientists, and professor of physics, New York City College (pp. 80–94), told of the Federation's wanting an early establishment of the Foundation. As between the two bills, S. 2385 and H.R. 6007, he said:

> We see great advantages in the executive committee setup which is provided for in H.R. 6007, and the more precise delineation of responsibilities which in one section seems to say that the Director, within the limits of policy set by the executive committee, shall be responsible for carrying out the intent on the bill.

He said that the Foundation should support basic research primarily, but surveys and policy recommendations should encompass all of science. "Both H.R. 6007 and S. 2385 are too restrictive on this point." He recommended that the word "basic" be eliminated in section 4(a). He did not agree with setting up special commissions and said that classified work was disadvantageous to the work of the Foundation. He also told of the dangers of coupling scientific support and foreign policy.

(4) *Representative Fritz Lanham* (pp. 94–99) objected to the creation of this Foundation. He said:

> In my judgment, the enactment of this bill would provide the basis for bureaucracy on a broad scale, and I think in all probability it would retard rather than stimulate our progress in the field of invention.

He also said that Government ownership and control of patents would stifle the incentive to invent.

(5) *Miscellaneous witnesses.* Approximately 25 letters and statements were submitted that supported the establishment of a National Science Foundation and about 5 were definitely opposed to it. Letters and statements were presented from the Government agencies and other organizations expressing their opinions on the bills.

Various views were presented favoring the legislation. Special commissions that were included in this bill were criticized as restricting the research. A letter from Robert W. King was included which opposed creation of the National Science Foundation. He advocated amendment of the personal income tax formula, so existing foundations could draw extensively from personal incomes.

3. REPORTS

a. House Report 2223

On June 4, 1948, the Committee on Interstate and Foreign Commerce reported favorably on H.R. 6007, with a few minor amendments. It described the purpose of the bill as follows:

> Stated briefly, the purpose of this bill is to create an independent agency of the Government to be known as the National Science Foundation and to grant to that agency appropriate authority to be used for the following purposes:
>
> (1) To develop and encourage the pursuit of a national policy for the promotion of basic research and education in the sciences;
>
> (2) To initiate and support basic scientific research through contracts or other arrangements, and to appraise the impact of research upon industrial development and upon the general welfare;
>
> (3) To initiate and support (after consultation with the Secretary of Defense) scientific research in connection with matters relating to the national defense through contracts and other arrangements;
>
> (4) To grant scholarships and graduate fellowships in the sciences;

(5) To foster the interchange of scientific information among scientists in the United States and foreign countries;
(6) To correlate its research programs with those of individuals and public and private research groups.

b. Senate Report 1151

The Senate Committee on Labor and Public Welfare reported favorably on S. 2385 (S. Rept. 1151) on April 20, 1948. S. 2385 was amended to correspond identically with H.R. 6007.

4. DEBATES IN CONGRESS

S. 2385 was debated in the Senate on May 3, 4, and 5, 1948. (Congressional Record, pp. 5175–5185, 5250–5252, 5301–5305). Senator Smith discussed his bill (pp. 5179–5183) in relation to the Presidential veto of S. 526. He believed that his bill met the President's objections in regard to the Director, the Executive Committee, and the Divisional Committees. The present bill (S. 2385) differed from S. 526 by making no provision for a division of national defense, and no provision for the creation of an Interdepartmental Committee on Sciences, nor did it specifically establish any named special commissions.

S. 2385 was passed by the Senate by a voice vote.

The bill failed to reach the House floor, so no legislation materialized in the 80th Congress.

F. 81ST CONGRESS (1949–50)

1. BILLS INTRODUCED

a. S. 247, January 6, 1949 (Messrs. Thomas (Utah), Kilgore, Fulbright, Magnuson, Smith (New Jersey), Cordon, and Saltonstall.

S. 247 provided for a Director to be appointed by the President, who would carry out the provisions of this act in accordance with "such policies as the Foundation shall from time to time prescribe." Each contract would contain its own patent provisions.

This bill ultimately became law. Its provisions are set forth in detail, infra, pp. 66–67.

b. H.R. 359, January 3, 1949 (Mr. Celler)

H.R. 359 provided for an Administrator to be appointed by the President to administer the National Science Foundation. It provided for patent rights to be held by the Federal Government, and discoveries to be freely dedicated to the public.

c. H.R. 12, January 3, 1949 (Mr. Priest); H.R. 185, January 3, 1949 (Mr. Harris); H.R. 311, January 3, 1949 (Mr. Wolverton); and H.R. 2751, February 15, 1949 (Mr. Biemiller)

Identical bills, similar to H.R. 6007 of the 80th Congress.

d. H.R. 1845, January 25, 1949 (Mr. Van Zandt), and H. R. 2308, February 3, 1949 (Mr. Mills)

Identical bills, similar to S. 247, supra.

2. HEARINGS AND SIGNIFICANT TESTIMONY

Hearings of the House Subcommittee of the Committee on Interstate and Foreign Commerce were held on March 31, April 1, 4, 5 and 26, 1949, on the above bills.

Letters were submitted from the various Government agencies, all favoring the establishment of a National Science Foundation. Comments again centered upon administration, patent policy, inclusion of social sciences, and the geographic distribution of funds. Most of the witnesses had presented testimony at previous hearings, and the overwhelming majority were for the establishment of the Foundation.

Hon. Fritz G. Lanham; John W. Anderson, president, National Patent Council, Gary, Ind.; O. W. Storey, engineer, Illinois; A. G. Dixon, Modine Manufacturing Co.; and other businessmen and engineers objected to the bills on various scores. Most of them felt that Government control would stifle initiative and that there was not sufficient safeguard to prevent the Foundation from carrying on applied research. Some went so far as to say that the bill is "alien inspired" and that it might benefit enemies by impairing the effectiveness of our industries.

3. REPORTS

The House Committee on Interstate and Foreign Commerce favorably reported out H.R. 4846 (H. Rept. 769) on June 14, 1949. The Senate Committee on Labor and Public Welfare reported out S. 247 (S. Rept. 90) on May 3, 1949.

4. ACTION IN CONGRESS AND PRESIDENTIAL APPROVAL

The Senate voted in favor of S. 247 on March 18, 1949, and the House passed S. 247 in lieu of H.R. 4846 on March 1, 1950. A conference was held to reconcile the differences between the two Houses. An agreement was reached in conference report 1958. The final bill was passed and sent to the President on May 1, 1950. He signed it on May 10, 1950, and it became Public Law 507 the same day.

G. PROVISIONS OF PUBLIC LAW 507 (MAY 10, 1950)

Public Law 507 provides that the Foundation should develop and encourage the pursuit of a national policy for the promotion of basic research and education in the sciences; that it should initiate and support basic scientific research in the mathematical, physical, medical, biological, engineering, and other sciences, by making contracts or other arrangements (including grants, loans, and other forms of assistance) for the conduct of such basic scientific research and to appraise the impact of research upon industrial development and upon the general welfare; to conduct research in national defense; to award scholarships and fellowships in the sciences; and to avoid undue concentration of research and education.

A Board of 24 members was to be selected solely on the basis of established records of distinguished service, and to consist of persons eminent in the fields of the sciences, etc.

The Director of the Foundation shall be appointed by the President, with the advice and consent of the Senate. The Board may make recommendations to the President with respect to his appointment, and the Director shall not be appointed until the Board has had an opportunity to make such recommendations. The Director should exercise powers in accordance with the policies established by the Board. The Board must review and approve actions taken by him.

The divisions within the Foundation are to be: (1) Division of Medical Research; (2) Division of Mathematical, Physical, and Engineering Sciences; (3) Division of Biological Sciences; and (4) Division of Scientific Personnel and Education, which shall be concerned with programs of the Foundation relating to the granting of scholarships and graduate fellowships in the mathematical, physical, medical, biological, engineering and other sciences. The Board may establish such other divisions as it deems necessary.

Scholarships and fellowships are to be given solely on the basis of ability, but in cases of two equally qualified applicants and one scholarship, it will be awarded so as to achieve the widest geographical distribution.

In the case of patent rights, each contract shall contain provisions governing the disposition of inventions in a manner calculated to protect the public interest and the equities of the individual or organization with which the contract or other arrangement is made, provided that the Foundation shall not enter into any arrangement inconsistent with the patent law. No employee may retain rights under the patent laws to any invention he makes during performance of his duties with the Foundation.

H. 83D CONGRESS (1953–54)

1. BILLS INTRODUCED (S. 977 AND H.R. 4689)

S. 977 (Messrs. Smith (N.J.) and Aiken) was introduced February 18, 1953; and H.R. 4689 (Mr. Wolverton), identical to S. 977, was introduced April 20, 1953. They called for amendment to the National Science Foundation Act as follows:

(1) By striking from subsection (d) of section 4 the sentence "A majority of the voting members of the Board shall constitute a quorum" and inserting in lieu thereof the sentence, "Eight of the voting members of the Board shall constitute a quorum."

(2) By striking from subsection (a) of section 16 the words "not to exceed $500,000 for the fiscal year ending June 30, 1951, and not to exceed $15,000,000 for fiscal years thereafter" and inserting in lieu thereof the words "such sums as may be necessary to carry out the provisions of the Act."

Hearings were held by the House Committee on Interstate and Foreign Commerce and by the Senate Committee on Labor and Public Welfare. S. 977 was reported out on July 11, 1953 (S. Rept. 396), and H.R. 4689 on May 11, 1953 (H. Rept. 374), both with amendments. S. 977 was passed in the Senate on June 13, 1953. It was passed in the House, in lieu of H.R. 4689, on August 3, 1953.

S. 977 became Public Law No. 223 on August 8, 1953.

2. PROVISIONS OF PUBLIC LAW 223 (AUGUST 8, 1953)

42 U.S.C. 1875. (a) To enable the Foundation to carry out its powers and duties, there is authorized to be appropriated to the Foundation, out of any money in the Treasury not otherwise appropriated, such sums as may be necessary to carry out the provisions of this chapter.[48]

NOTE.—Subsec. (b) remains the same.

I. 84TH CONGRESS (1955–56)

1. BILLS INTRODUCED (H.R. 11200)

H.R. 11200 (Mr. Holland) was introduced May 14, 1956. It sought to amend the National Science Foundation Act of 1950 by providing for the training of additional engineers and the expansion of facilities for engineering education by providing supplementary salary grants for engineering teachers and scholarships and fellowships for engineering students. No action was taken on this bill.

J. 85TH CONGRESS (1957–58)

1. BILLS INTRODUCED (S. 1021, S. 1242, S. 3119, S. 3268, H.R. 2450, H.R. 7431, H.R. 9246, H.R. 10180, H.R. 11950, H.R. 11985)

S. 1021 (Mr. Pastore) was introduced February 1, 1957. It would amend the National Science Foundation Act by authorizing the award of a $500 scholarship to high school students who pass a specified examination in mathematics and further scholarships of $500 to those who pass an examination in calculus at the end of the first year in college. No action was taken on this bill.

S. 1242 (Mr. Jackson) was introduced on February 18, 1957. It would authorize the award of scholarships and graduate fellowships to individuals who are not citizens of the United States but where, in the judgment of the National Science Foundation, the national interests can be served and such individuals have expressed their desire to become citizens.

S. 3119 (Mr. Mansfield) was introduced January 23, 1958. It provides that scholarships and fellowships for scientific study or scientific work shall be awarded in such numbers as may be necessary to meet the needs of the United States for personnel in the various fields of science. It empowers the National Science Foundation to agree to have the recipient serve a certain period in Federal service or other service of national interest in return for such scholarship or fellowship. No action was taken on this bill.

S. 3268 (to be described later).

H.R. 2450 (Mr. Holland) was introduced on January 10, 1957. It was similar to H.R. 11200, which he introduced in the 84th Congress. No action was taken on this bill.

H.R. 7431 (Mr. Burns of Hawaii) was introduced on May 10, 1957. It would make an appropriation of $2,500,000 to be used by the National Science Foundation to construct and equip a geophysical institute in Hawaii. No action was taken on this bill.

[48] Amendment of Aug. 8, 1953, ch. 377, 67 Stat. 488

H.R. 9246 (Mr. Dixon) was introduced on August 13, 1957. It would direct the National Science Foundation to initiate and support a program of study, research, and evaluation in the field of weather modification. It would abolish the Advisory Committee on Weather Control and transfer its functions, duties, and records and any unexpended funds to the National Science Foundation. No action was taken on this bill.

H.R. 10180 (Mr. Sikes) was introduced on January 21, 1958. It was, in many respects, similar to the bills introduced by Mr. Holland (H.R. 11200 in the 84th Cong. and H.R. 2450 in the 85th Cong.). It would provide for the training of additional engineers and scientists and the expansion of facilities for engineering and science education by providing scholarships and fellowships for engineering and science students under the National Science Foundation Act. No action was taken on this bill.

H.R. 11950 (Mr. Teague of Texas) was introduced on April 16, 1958. This bill was similar to H.R. 10180, above. No action was taken on this bill.

H.R. 11985 (Mr. Celler) was introduced on April 17, 1958. It would establish within the National Science Foundation, a National Scientific and Technical Information Service for the collection and dissemination of information in the fields of science and technology. No action was taken on this bill.

S. 3268 (Mr. Hill and Mr. Smith of New Jersey) was introduced on February 13, 1958, and H.R. 11257 (Mr. Harris) was introduced March 10, 1958. These bills would amend the National Science Foundation Act to provide for the annual meeting of the National Science Board during the last 2 weeks of May (now first Monday in December); to authorize the Director or the executive committee to take final action in awarding scholarships, fellowships, or contracts where such action is taken pursuant to the delegation of authority from the Board (now each scholarship, etc., requires approval by the Board); to provide for the executive committee to consist of from five to nine members (now consists of nine members); to authorize the awarding of scholarships or fellowships for study or work at any nonprofit institution (now limited to institutions of higher education); to authorize the Foundation to enter into contracts or arrangements for the carrying on of scientific activities deemed necessary (now limited to basic scientific activities); to authorize the Foundation to facilitate any international scientific activity (now cooperate with) consistent with the purposes of the act; to authorize the Foundation, with the approval of the Secretary of State, to grant scholarships, etc., to foreign nationals (foreign nationals now excluded); to authorize the Foundation, with the approval of the Secretary of State, to undertake programs of scientific activities abroad deemed to be in the interest of the United States; to authorize the Director to conduct or provide training for employees of the Foundation under certain conditions.

S. 3268 was reported, with amendment (S. Rept. No. 2367) and H.R. 11257 was reported, with amendment (H. Rept. No. 2642). S. 3268 was amended and passed by the Senate. It was also amended and passed by the House in lieu of H.R. 11257. However, the bill never got out of conference, and therefore this bill was not passed in the 85th Congress.

44515—60——6

III. OFFICE OF TECHNICAL SERVICES

A. BACKGROUND

An Office of Technical Services was established by Executive order during World War II.[49] It served as a clearinghouse for technical and scientific information needed by businesses and industry. Because of the importance of technological development in the success of individual businesses, it was found that there was need for such a program in peacetime.

However, in 1947 and 1948, the Department of Commerce's requests for appropriations to carry on this activity were stricken by the House of Representatives on points of order. The Senate authorized the appropriation, and it was included in the appropriation act as finally passed, but to avoid continued uncertainty as to authority for this activity and to facilitate the continued operation and planning of the program, the Department of Commerce asked that statutory authority be given.

B. BILLS INTRODUCED AND CONSIDERED, 1945–47

1. S. 1248, JULY 9, 1945 (MR. FULBRIGHT)—79TH CONGRESS

a. Provisions

S. 1248, as introduced by Senator Fulbright, would establish a Bureau of Scientific Research within the Department of Commerce. It would be the function of that Bureau to: (1) develop and act as a broker for inventions submitted to it; (2) support industrial research; (3) act as consulting engineer; and (4) act as a source of technological information.

To effectuate these purposes, the Bureau would—

> (*a*) Examine and keep a record of all inventions, products, and scientific or technical processes submitted to the Bureau by any person for the purpose of determining their commercial possibilities.
>
> (*b*) Develop through the facilities of the Bureau such inventions, products, and processes as are found qualified for future commercial utilization.
>
> (*c*) Offer to the public for nonexclusive private exploitation, by qualified industries or individuals, such inventions, products, or processes as are determined fitted for private development.
>
> (*d*) Provide for proper awards to be made to persons whose inventions, products, or processes are approved for private utilization.
>
> (*e*) Collect, edit, publish, and disseminate pertinent data on all inventions and discoveries and other findings resulting from federally financed research and development activities.

Section 5 outlined the policy on patents:

> Any invention, product, or scientific process devised by any person, may be filed with the Bureau in such manner and

[49] Executive Order 9568, 10 Fed. Reg., p. 6917 (1945); Executive Order 9604, 10 Fed. Reg., p. 10960 (1945); Executive Order 9809, 11 Fed. Reg., p. 14281 (1945).

under such rules as the Bureau shall prescribe, and such person shall by such filing waive all rights existing under the patent laws of the United States. The Bureau may analyze each invention, product, or process, when properly filed, from a scientific, economic, and legal standpoint before approving such invention, product, or process. If * * * the Bureau finds such invention * * * practicable and * * * would promote industry * * *, the Administrator, acting on behalf of the Federal Government, shall patent such invention * * * any provision of law to the contrary notwithstanding. No fee shall be charged by the Commissioner of Patents for the granting of a patent to the Administrator pursuant to this act. If the Bureau shall find such invention * * * not practicable it shall return it, together with all rights pertaining thereto, to the person submitting the same.

Section 6 provided that any person, corporation, or other organization desiring to use any invention developed under the act, shall be granted a nonexclusive license for the utilization of such invention for such period as the Administrator deems advisable. A license could not be granted if granting it to the applicant would tend to increase monopoly.

The Bureau would be paid a royalty by the licensee not to exceed 4 percent of the gross income resulting from the utilization of such invention, and the Bureau would pay a portion, not less than 50 percent of such amount, to the inventor.

Section 6 also provided:

(c) All applications for patents, question of patent interference, and infringement litigation, in which the United States is interested by virtue of its interest in such inventions, products, or processes, as provided in section 3(e) of this Act, shall be handled by the Department of Justice. The Department of Justice, upon request by the Administrator, shall intervene in behalf of any licensee of the Bureau in any litigation brought by any patent owner against such licensee for infringement or any other interference growing out of the issuance of a license by the Bureau.

(d) Notwithstanding any other provision of this Act, the Bureau shall declare secret or restricted any scientific or technical information, data, patents, inventions, or discoveries in, or coming into, the possession or control of the Bureau or any other Federal agency, the secrecy or restriction of which the President or his designee or designees certify as being essential in the interest of national defense.

b. Hearings and significant testimony

Hearings were held before a Senate subcommittee of the Committee on Commerce on December 12, 13, and 14, 1945.

(1) *Senator Fulbright* (pp. 8–13), in his explanation of S. 1248, said that it was originally to be considered with the Magnuson-Kilgore bill (S. 1850 to establish the National Science Foundation), but that S.

1850 was concerned with basic scientific research and his bill was concerned with its application. He said:

> This bill under consideration is designed to provide a means for American industry to make use of basic science and technology that may be developed by the proposed National Science Foundation—that is the one contemplated by the Magnuson-Kilgore bill—or from any other source. It has been called the applied sciences bill.

Senator Fulbright added that the section of the bill that provided for the establishment of a central technical office for dissemination of technological information and engineering data would render a great service to industry. He said:

> While the bill is primarily designed to aid small business, which is unable to maintain technical services and research organizations, it will enable all industry to keep its operations up to date without incurring an expense that is beyond the reach of the average business organization, and its records and facilities will be adapted to serve the Nation through the advancement of technological developments wherever possible of utilization.

He told of the difficulty the inventor has in introducing his invention and declared that this bill, S. 1248, would provide a service through which technological developments and new inventions could be properly analyzed and perfected to make them readily available to small industry, or to individuals who might wish to enter into new businesses.

Senator Fulbright said further that:

> The Office of Technical Services in the Department of Commerce would be authorized to procure the services of outstanding scientists, engineers, chemists, and other professional experts, to provide small enterprises with the best possible research facilities. Among the objectives of the bill is the stimulation of interest in research, the establishment of a central scientific and technical office to assure maximum use of all new inventions, and to give wide distribution to scientific developments and pertinent information, to compile all available research data for easy accessibility to inventors, research institutions, and business in general.

As to patents, he declared that the results obtained in research would become public property, other than to pay the inventor or patent holder a fair royalty, and would insure its widest possible utilization. To overcome any objections on the part of patent attorneys, he indicated that perfecting amendments had been proposed which would permit the Federal Government to assist an inventor to secure the necessary funds to procure a patent through an attorney of his own selection.

(2) *Hon. Henry A. Wallace*, Secretary of Commerce (pp. 14–22), told of the great need for development and dissemination of technical information. He said that both bills (S. 1850 and S. 1248) would pay enormous dividends to the country in the form of improved products, new industries, opportunities for investment and employment, and a higher standard of living.

He said that the bill should help eliminate the timelag between discovery and the use of the discovery.

As to patents, he said:

> The patent-development provisions of S. 1248 constitute, to my knowledge, about the only effort which is currently being made to find a legislative solution to the important problem of encouraging the more effective introduction and marketing of inventions.

He described the success of the National Inventors Council during the war in stimulating military inventions.

(3) *Brooks Walker*, inventor (p. 26–33), believed that the bill would help to give encouragement and support to the independent inventor. He said that many important inventions were seriously delayed because of the financial status of the inventor. He felt that the bill would benefit small business because—

> It is not practical at all for a private inventor to contact other than the larger companies, just because of the time involved in trying to physically go around and visit the thousands of smaller companies which may or may not be interested, and that is where an agency such as this could act as a clearinghouse, which would be extremely valuable.

He also said that the 17-year lifespan of a patent was sometimes all used up before the invention got around to production, and then others got the benefit. He thought the bill would have no adverse effect on patent attorneys. He objected to limiting the royalty to 4 percent of the gross income since some inventions are not manufactured in large enough quantities to make 4 percent a profitable return.

(4) *S. B. Fracker*, research coordinator, Agricultural Research Administration, Department of Agriculture (pp. 35–44), approved of the legislation. He told of the Department of Agriculture's policy of favoring unrestricted nonexclusive licensing of inventions developed from federally financed research so long as it brought new discoveries into use. However, the problem of the hesitation of manufacturers to undertake the development of inventions where the original development cost would be considerable is a problem not yet solved. Therefore, he added—

> We are accordingly pleased to note in the committee print of the bill (sec. 6a) that when a patent runs over a year without any license being applied for or issued, the proposed Office of Technical Services would be authorized to issue licenses on a "more exclusive basis."

(5) *Prof. Walter Rautenstraucht*, consulting engineer and member of the faculty of Columbia University (pp. 48–55), approved the bill. He felt that some formula might be found which would establish an equity which perhaps is not established by the mere 4 percent of gross income.

(6) *Senator James E. Murray*, in a statement read by Dr. Dewey Anderson (pp. 71–76), said that the Small Business Committee was greatly in sympathy with the purposes of the Fulbright bill.

(7) *Edward U. Condon*, Director, National Bureau of Standards (pp. 76–82), believed that there is need for governmental activity in this field and that this bill provides an adequate instrumentality for this purpose.

(8) *Senator Alexander Wiley* commented that he was concerned that the bill might curb initiative.

(9) *John C. Green*, chief engineer, National Inventors Council (pp. 86–94), said:

> The objectives of the Fulbright bill, as I interpret them, are essentially to expedite the transformation of creative ideas into marketable items which will in turn create additional productive job opportunities. I believe that these objectives are logical and sensible and the bill contains appropriate provisions to carry them into practical effect.

The average inventor, he declared, brings his ideas to larger companies since he has no way of knowing if some smaller company would want the product. He said that the bill would help inventors to learn the procedures for commercializing their inventions and enable them to obtain needed advice before going to the Patent Office.

Senator Wiley suggested that the requests would run into the millions and posed the problem of getting a staff to handle them. He indicated his belief that the patent attorneys were performing an adequate job in this respect. Mr. Green replied that they (the National Inventors Council) handled as many as 2,000 requests a day during the war with no trouble. He emphasized that someone should give the inventor a helping hand, that too many people think of the inventor as a "crackpot." On the other hand, inventors with unproductive ideas would be saved unnecessary expenditures. On this last issue Senator Wiley made the following point:

> If a fellow has an unproductive idea, is it the business of the Government to give him that information or is it his business to find out? Should he not pay some lawyer to find out whether it is unproductive, or should the Government butter his bread and not butter mine?

(10) *D. F. Cleary*, acting assistant administrator, Retraining and Reemployment Administration, Department of Labor (pp. 94–98), expressed the viewpoint of the veteran. Veterans had acquired mechanical inventiveness during the war, and this bill would help continue it.

(11) *Raymond M. Wilmotte*, Wilmotte Laboratories (pp. 82–86, 98), believed the bill would be of considerable benefit to general technical progress as well as to small business.

(12) *C. E. Earle*, director of the Earle Research Laboratory (pp. 99–101), told of the necessity of the bill for small industries, and of the importance of small industries from the dispersal standpoint in case of nuclear attack.

(13) *Clark L. Fry*, designing engineer (pp. 105–107), was in favor of the bill. He said that a survey of inventors showed that the main problem was lack of communication and understanding between inventor and patent attorney. Many worthwhile inventions have not gotten on the market as a result.

(14) *R. J. Dearborn*, chairman, patents committee of the National Association of Manufacturers (pp. 107–109), asserted that commercialization was not a job for Government:

> * * * if the Government were to assist the inventor and carry the development only part way, such as might be represented by the building of a model or a tryout of the idea, the inventor would be left in an impossible position to obtain capital to commercialize his invention if the U.S. Government owned a half interest in it and if he was required to grant nonexclusive licenses to any who desired to acquire the license.

He was against all the patent provisions of H.R. 1248.

(15) *Vannevar Bush*, Director, Office of Scientific Research and Development (pp. 108–109), stated:

> In regard to the proposal in S. 1248 that the Government establish some administrative mechanism for obtaining private exploitation of worthy inventions, I recommend considerable caution in acting. This would be a tremendous administrative undertaking. Before embarking on it, I would urge that some detailed effort be made to assess the experience of those private, nonprofit organizations which have attempted the same thing. Is it a fruitful field for Government participation? Would the administrative burden be too onerous? Is there a need in certain areas for Government assistance in exploiting new inventions? By what mechanism and under what conditions can that assistance be rendered best? Other questions of importance will also occur to you for inquiry.

He emphasized that the program should avoid conflict with the National Science Foundation, and maintained that the Government could help in other ways than through full-scale legislation, e.g., by improvement in Government information services on technical matters, by adjustments in our tax laws to allow deductions for research and development expenses, and by strengthening the patent system.

(16) *Casper W. Ooms*, Commissioner of Patents (pp. 110–112), believed that the bill would fill a real need in our society and pay large dividends. He suggested improvements in the patent provisions.

c. Report and amendments

The Senate Committee on Commerce favorably reported the bill, with amendments, on January 29, 1946 (S. Rept. 908).

The report stated that the primary purpose of the bill was to coordinate the Government's technological research facilities and information and make them readily available to business. The second important purpose was to afford facilities to independent inventors for evaluation of their inventions. It also provided for wider use of public-controlled patents in private business.

Examples given to point out the benefits of this bill were (*a*) a veteran wanting to start a small manufacturing business could have access to the technological clearinghouse to find out what new products or devices were available for him to produce; and (*b*) if he invented a

new device he could go to the Office for help and guidance in completing the development of his idea and in making proper arrangements for its exploitation by industry.

The principal amendments were designed to overcome objections brought out in the hearings that (1) the administrative burden involved in providing an evaluation of the invention might take more time and money than the result justified; (2) the provisions for fixing and sharing royalties might prove difficult to administer; and (3) competition with patent attorneys might result.

A fee of $10 was established to safeguard the Office against a large volume of trivial requests. In return for the fee, the inventor would secure a public recording which would furnish him some protection against other persons claiming to have originated the idea prior to the time the patent was issued.

The problem of the establishment and sharing of royalties was overcome by providing that ownership should be retained by the inventor. However, if the idea were practicable and would result in large public benefits, and if it could not be privately developed and marketed, the Government might make an advance to the inventor of not more than $1,500 for further development and, if necessary, might undertake full development in Government laboratories. In addition, an advance might be made to the inventor for the expense of obtaining a patent. In exchange for such assistance the inventor would agree with the Government to make the patent available for use on a nonexclusive license basis and to repay advances made by the Government out of royalties on such licenses.

The objection to possible competition with private patent attorneys was overcome by leaving the inventor free to employ his own attorney for the purpose of taking out patents.

d. Debates in Congress

S. 1248 was debated in the Senate on March 1, 1946. Senators Mead and Fulbright described the benefits of S. 1248 (Congressional Record, p. 1818). Senator Taft objected to the bill, saying that it was "exceedingly broad." By authorizing the Secretary of Commerce—

> to undertake engineering or technological research on industrial, commercial, or related problems of an important general nature, including the development of such inventions, products, and processes as may be qualified for future utilization—

he felt that the bill was broad enough to include all basic research and certainly broad enough to include intermediate basic research. He suggested that this bill could be included in the National Science Foundation bill. He took the position that the initiation and sponsorship of engineering or technological research or development in private or nonprofit institutions should be the responsibility of a single agency; that the Congress should decide which one should do it and not approach the subject piecemeal.

Senator Mead emphasized the great benefits this bill would have to small business (pp. 7935–7938). He said that small business would "starve at the roots" if it could not make use of the fruits of

science. Through this legislation the new devices and processes inaugurated during the war could be made available to the little businessman and small manufacturer; businessmen would use the Office for information; inventors would use it for an appraisal of their ideas; and private businesses would use it to get technology available through publicly-owned patents.

No further action was taken in the 79th Congress.

2. S. 493, FEBRUARY 5, 1947 (MESSRS. FULBRIGHT AND AIKEN)—80TH CONGRESS

a. Provisions

S. 493 was the successor to S. 1248. It provided for the establishment of a central clearinghouse of technical information in the Department of Commerce, for aiding research by inventors, and for promoting the introduction of inventions into manufacturing.

The bill endeavored to avoid putting the Government in the business of buying and selling inventions which appeared to have a commercial value. It placed the burden for exploitation of the individual's inventions upon the individual himself, rather than upon the Government, except to the limited extent for which special provision is made under sections 2(f) and 3.

Section 2(f) vested in the Secretary of Commerce the power:

> To initiate and sponsor, * * * engineering or technological research or development relating to articles, equipment, materials, supplies, structures, methods, mechanisms, and processes, such research or development to be carried on by public departments and agencies or by private profit or nonprofit institutions and persons pursuant to contracts or other arrangements under which he may finance, in whole or in part, such research or development from funds specifically earmarked for the purposes of this subsection under the terms of annual appropriations Acts.

S. 493 omitted several powers of the Secretary set forth in S. 1248, including the power "to offer to the public for private exploitation * * * such inventions * * * as he determines to be fitted for private developments."

Subsection 3(d) provided that:

> Any contract or other arrangement providing for a commitment of public funds hereunder (1) shall include an agreement whereby the United States Government, in the event the project proves commercially profitable, will receive a return of at least its share of the cost of the research or development project for which commitment has been made, except with respect to resulting patents retained by or assigned to the United States Government under the terms of such contract or other arrangement; (2) shall contain in any event such provision as may be deemed necessary and desirable to secure to the United States Government the continued use, free of any charge, on any invention, product, process, or patents resulting from the research or development project for which such

> commitment has been made; (3) shall contain such further provisions as may be necessary to conform to laws of the United States relating to Government patents or to Government research and development; and (4) may be entered into without regard to sections 3709 and 3648 of the Revised Statutes and the civil service and classification laws.

The Secretary might make a record of each invention, make an analysis of its possibilities, and render a written report thereon. The report was to be limited to transmitting information to assist the person to arrive at his own independent informed judgment as to whether the commercial potentialities of his invention would warrant further development.

b. Hearings and significant testimony

Hearings were held before the Senate Committee on Expenditures in the Executive Departments on May 19, 20, 21, 22, 23, and 28, 1947.

Witnesses included the following:

(1) *Vannevar Bush* (pp. 200–222) said that although it was desirable to improve the means of tapping inventive resources, S. 493 was not sufficiently definite to guide the person who would administer it or the persons who would wish to avail themselves of its benefits. The Government should avoid large expenditure of funds without adequate return to the Nation. He said that a critical study should be made of existing Government agencies, the National Inventors Council and the Canadian National Research Council to see whether this legislation was necessary.

He added:

> I must reluctantly conclude that this bill will not result in values to the country as a whole commensurate with the costs involved.

He believed that services to be performed in the bill are being performed every day—

> by trade journals, technical publications, individual and group promoters, consulting engineers, economists, and experts of various kinds, by patent attorneys, and commercial and academic research laboratories.

Dr. Bush said that he preferred relying on the initiative of citizens; that the costs should be charged to users of the services and not to the entire group of taxpayers; and that the size of the undertaking might be enormous. He also questioned whether small and new businesses would really be the gainers.

He described the pressures of tax structure and suggested revising the method of evaluating small enterprises, so they would not be forced to sell their interests to large companies. He pointed out other restrictions, and suggested liberalizing Securities and Exchange Commission regulations.

(2) *John C. Green*, director, Office of Technical Service (pp. 21–26, 155–174), described a study made with Canadian officials of the Canadian National Research Council. He said that although the present bill was designed with small businesses in mind, it would have the effect of aiding all business. It could be carried on under the present

budget for the Office of Technical Services and would charge fees which would defray cost of additional functions.

He presented a study on the relationship of the Fulbright-Aiken bill (S. 493) to existing functions of the Department of Commerce, and added:

> The Department feels that passage of the bill is imperative to enable it to keep its business services up to the needs of the postwar age, and to provide guidance in the reorganization of its technical services that will be required with the expiration of strictly temporary functions, such as the collection of technical data from Germany, in the coming fiscal year.

He described how the bill would aid inventors, especially in obtaining legal protection from the time of conception of a new process. Where private research was lagging, the Secretary could initiate such research on his own initiative, but this would be done only where private enterprise was unlikely to undertake the research.

Mr. Green also warned:

> Fundamental matters, such as the role of the commercial laboratory in perfecting an invention, or the necessity for complete disclosure to and confidence in one's patent attorney, will be valuable. However, attempts to forecast the market value of an invention or similar services should be scrupulously avoided.

(3) In oral testimony, *Senator J. William Fulbright* (pp. 37–52) explained the differences between the bills to establish the National Science Foundation and his bill (S. 493). The National Science Foundation, he pointed out, was designed for basic research, whereas his bill related to applied research.

He felt that the bill would help to prevent monopoly, and emphasized that all our business should not be concentrated in a few corporations since this would eventually lead to Government control. He added that the Office should be directed along lines which would strengthen the competitive system and discourage monopolies.

He also urged the need for an agency to serve inventors. The Patent Office does not offer service until an idea is reduced to practice; the Office of Technical Information, on the other hand, would enable an inventor to register the conception of an idea so that the date on which he conceived the idea would be made a matter of record which could be admissible as evidence. Commercial evaluation of an inventor's idea would be provided. This information would be supplied to anyone, not only inventors and small businessmen, but to large business organizations and Government units. The service here contemplated would not compete with patent attorneys and industrial engineers.

He described how agricultural experiment stations had benefited farmers.

(4) *Edward U. Condon*, Director of the National Bureau of Standards (pp. 54–57), said that some sections of the bill were of value, others not.

> I personally do not see as clear a need for the parts of the bill which have to do with providing public records of invention and providing inventors with preliminary reports on them as described in section 4.

He felt such a provision would be difficult to administer. His favorable comments included the following:

> I think there is a real and valuable service to be performed by assisting in the development of a complete technological library of reports and documents and by making these papers available on a national service basis; and that also a valuable service could be rendered by authorizing the Secretary of Commerce to enter into contracts, particularly with university engineering laboratories, to stimulate technological studies.

(5) *W. V. Lambert,* administrator, Agricultural Administration, Department of Agriculture (pp. 65–69), said:

> It is our feeling in the Department of Agriculture that the support of commercial development work, such as is proposed in bill S. 493, would be in the public interest, especially in the assistance it can give to small business and to inventors that are working independently and are not connected with large industrial plants.

He warned against overlapping with the work of the Department of Agriculture, whose patent policy differs from that in other Government agencies:

> In the Department of Agriculture, we have taken the position that we have at present no legal authorization for the employment of funds appropriated to us for any purpose that would result in profits to an individual, whether an inventor or not, rather than to the people of the United States as a whole.

(6) *Maj. Gen. Henry S. Aurand,* director of Research and Development Division, Chief of Staff, War Department (pp. 77–83), warned that the research of the War Department could not be continued behind closed doors. It must be a "two-way street" where information moves from the War Department to industry and vice versa. He told of the necessity of having ideas, data, reports, and articles readily available to researchers and inventors.

(7) *R. S. Pasley,* counsel, Office of Naval Research, Navy Department (pp. 84–95), described Navy procedure on patents. The Navy allows industry to keep patents on research which the industry, itself, had spent much time and money on.

Senator Hickenlooper suggested that the Government should get a modest royalty fee on its patents.

Mr. Pasley presented a statement of *Rear Adm. Paul F. Lee,* Chief of Naval Research, who said the Navy was in accord with the purpose of establishing in the Department of Commerce a clearinghouse for information aiding invention. His only concern was that it should not conflict with the National Science Foundation and other research programs. Also, he would not want a modification of the patent program followed by the Army and Navy.

(8) *J. E. Hobson,* director, Armour Research Foundation (pp. 96–104), said basic research should not be placed under Federal administration, but that tax laws should be amended so industry could be stimulated to increase the flow of funds to colleges and universities.

He did not agree with part of the bill:

> First of all I think industry has a powerful stimulus to do research anyway, and I rather doubt if the Government needs to step into that picture, and in the second place, industry is interested in taking basic scientific knowledge and trying to apply it to solve specific problems.

He felt that the Federal Government should not have patent rights developed in connection with industrial research. He agreed with the part of the bill that related to the collection and dissemination of scientific information.

(9) *Howard E. Blood*, president, Norge Division, Borg-Warner Corp., and chairman, committee on patents and research, National Association of Manufacturers (pp. 122–147), opposed the bill because:

> 1. It necessarily involves unwarranted invasion of private enterprise's legitimate and necessary sphere of activity.
> 2. The objectives of the bill are exceedingly unlikely to be attained because no corps of Government employees, no matter how large, could be sufficiently acquainted with all of the myriad activities, problems, and techniques of industry as to be able to render service of value.
> 3. The expense involved would be prohibitively large and out of all proportion to any actual benefits to be derived.
> 4. It would impair, rather than stimulate, the effectiveness of private enterprise.
> 5. There is no demonstrated justification for this legislation.

He favored greater dissemination of information, but doubted if it were possible to achieve this through the means mentioned in the bill. He pointed out that it was difficult to determine the potentialities of any new invention; how a Government official would make such an appraisal was, in his opinion, a moot question. It might actually end up discouraging inventors when encouragement should be given.

(10) *Clarence E. Earle*, representing Maryland Economic Council (pp. 178–189), said that the council unanimously supported S. 493. Three things he considered most valuable in the bill were: establishment of a reference repository covering every phase of scientific and comparable knowledge in the United States and abroad; establishment of a service making scientific and technical knowledge readily available to business and industry; and the promotion of the development of technology through applied research whenever independent business calls for assistance that requires such work.

(11) *Frank B. Jewett*, President, National Academy of Sciences (pp. 197–199), said:

> In summary, after having considered S. 493, I am very certain that legislation of the kind proposed is not needed; will serve no useful purpose; will tend to cause confusion in industry rather than aid it; and in the main serve merely to keep several hundred civil servants busy shuffling papers in the Department of Commerce to no material useful end.

He maintained that what the bill proposes is already being done in industry and commerce, would be of little aid to inventors, and would

penalize rather than be an incentive to the small, enterprising businessman.

(12) *Raymond M. Wilmotte*, Raymond M. Wilmotte, Inc. (pp. 199–200), was in favor of the legislation, but suggested that a clause should be inserted stating:

> No project shall be financed under this Act to be carried out by governmental or nonprofit organizations unless no commercial facilities are available.

(13) *P. J. Federico*, examiner in chief, U.S. Patent Office, reading a statement of *Casper W. Ooms*, Commissioner of Patents (pp. 222–230), felt that the main advantages of the bill were that small businessmen would have a place to turn for technical advice and aid, and inventors could use this as a place to offer their inventions for use to private industry. He especially approved of establishing a central agency where technical information could be gathered and classified. He also thought that much unnecessary or misguided effort on the part of the inventor, could be avoided by his obtaining an appraisal of his invention.

(14) In written testimony, the *National Small Business Men's Association* (pp. 230–231) opposed the bill because:

> 1. Existing laws protect discoveries of engineers, inventors, scientists, and technicians.
> 2. The dissemination of technological and scientific information concerning such discoveries is presently possible through existing agencies.
> 3. Such discoveries as are in the interests of American industry and business can be presently ascertained and used by American industry and business through direct arrangements with the discoverers where such discoverers desire such use.
> 4. Where the discoverers do not desire such use the Government should not violate this right of private property in the individual citizen.

(15) *Miscellaneous Government agencies*. Letters were submitted from the Departments of War, Navy, Agriculture, Commerce, and the Administrator of the National Housing Agency. None of these objected to the bill, but several improvements in certain details were suggested.

c. Report and amendments

The Senate Committee on Expenditures in the Executive Departments reported favorably on S. 493, with an amendment, on June 27, 1947 (S. Rept. 395).

The amended bill kept the provision to make existing technical, engineering, and scientific information and processes more readily available to American business and industry through a clearinghouse in the Department of Commerce. It eliminated all provisions for advice and assistance to inventors on the possible merit of their ideas and in the development or marketing of inventions or patents.

In justifying its amendment, the committee said:

> The original bill provided three main fields of activity: (1) The establishment within the Department of Commerce of a

clearinghouse for the dissemination of technical information obtained from foreign and domestic sources of value to industry, with special emphasis on assistance to small business with limited technical facilities; (2) cooperative research through utilization of commercial laboratories, and public and institutional research facilities, partially financed by industry, dealing with specific technical problems of an industrywide nature when requested by representatives of such industry; and (3) the filing of inventions as a matter of record, the collection and evaluation of military inventions for the armed services, and general advice and assistance to inventors.

Practically all who appeared before the committee were in general accord with that part of the bill having to do with dissemination of information. The opposition was primarily centered on the section providing for assistance to inventors, through the evaluation of their ideas and the technical services provided to assist them in properly marketing their inventions and to the provisions in regard to research and experimentation. The committee considered these objections to be well founded, and has, accordingly, eliminated those sections from the bill.

In summary, the committee said:

It is the opinion of this committee that such service will result in an extremely valuable means of utilizing available technology from military and other Federal basic research and development, by encouraging adaptation of techniques and processes having industrial value resulting from the hundreds of millions of dollars currently being appropriated by the Congress for such research. Without this bill, we will be paying billions for military research, and losing the opportunity for widespread peace-time, commercial applications.

d. Debates in Congress

Senator Ferguson spoke against the bill on July 23, 1947 (Congressional Record, pp. 9791–9792), saying it would merely create another bureau; that the Patent Office and the Library of Congress were performing the same task adequately. No further action was taken n the 80th Congress.

3. S. 868, FEBRUARY 8, 1949 (MR. JOHNSON, OF COLORADO)—81ST CONGRESS

a. Provisions

Identical to amended bill S. 493.

b. Action, Senate

The Senate Committee on Interstate and Foreign Commerce reported out S. 868 (S. Rept. 675) on July 14, 1949, during the 1st session of the 81st Congress.

Mr. Johnson, by way of explanation, said S. 868 would (1) establish a clearinghouse in the Commerce Department for the dissemination

of technological information obtained from foreign and domestic sources which would be of value to American industry, particularly small businesses which have limited research facilities and technical staffs, and provide a needed reference source of technical information for the benefit of all American business; and (2) provide Government agencies and private persons with a procedure for recording technical developments of a marginal character, thus saving them the expense of filing defensive patent applications.

S. 868 passed the Senate on August 9, 1949 (Congressional Record, p. 9421).

c. Action, House

The House Committee on Interstate and Foreign Commerce reported out S. 868 (H. Rept. 2356), with amendments, on June 28, 1950, during the 2d session of the 81st Congress.

The major change was to strike out section 3, "Recording of Technical Developments," which provided for the voluntary filing and formal recording of scientific and technical data and provided for the issuance of a certificate which would be evidence as to the date of filing. The committee felt that its relationship to the patent laws was not clear and its consideration should be deferred.

Mr. Sabath, from the Committee on Rules, submitted another report (H. Rept. 2919) recommending passage of House Resolution 808 (similar to S. 868).

On August 28, 1950 (Congressional Record, p. 13634), the bill was debated in the House. Mr. Priest told of the hundreds of millions of dollars appropriated for Government research, the results of which are usually compiled in reports and are filed with the agency sponsoring the work. Even reports on nonclassified research, he pointed out, are filed away and rarely, if ever, reach the industrial community. He declared that if this information could be carefully cataloged and centrally recorded, both the Government and industry could use it and thereby avoid wasting time and money in fruitless duplication.

The committee amendments were agreed to and the bill was passed by the House, August 28, 1950 (Congressional Record, p. 13637).

The Senate concurred in the House amendment on August 31, 1950 (Congressional Record, p. 13940), and the bill was approved September 9, 1950, becoming Public Law 776.[50]

4. PUBLIC LAW 776 (81ST CONGRESS), SEPTEMBER 9, 1950

Public Law 776 provided for the collection and dissemination of scientific, technical, and engineering information through a central clearinghouse established in the Department of Commerce. The Secretary was directed to make such information available to industry and business, to State and local governments, to other agencies of the Federal Government, and to the general public. He was also to remove security restrictions in some cases. The Secretary was directed to refer all information of military value to the armed services.

IV. NATIONAL INVENTORS COUNCIL

The National Inventors Council was created in August 1940 by the Secretary of Commerce to receive, evaluate, and pass on to appro-

[50] 64 Stat. 823 (1950), 15 U.S.C. sec. 1151 (1952).

priate branches of the armed services all inventions, inventive ideas, and new products and processes submitted by the public as a contribution to the war effort. The council included in its membership noted inventors, industrialists, and public officials, including Army and Navy representatives. In January 1947 the Secretaries of War and Navy asked the council to continue for an indefinite period its work of screening military inventions. The technical supporting staff which receives and evaluates inventions is now a part of the Office of Technical Services of the Department of Commerce. Dr. Charles F. Kettering, General Motors Research Corp., was chairman until his death in 1958. He was succeeded by Dr. Charles Stark Draper, Massachusetts Institute of Technology. Homer H. Ewing is secretary.

William C. Foster, Under Secretary of Commerce, in testifying before the Senate Committee on Commerce (on the bill to establish an Office of Technical Services, May 19, 1957, p. 58), described the work of the council as providing a two-way service:

> (1) Important inventive problems encountered by the armed services are brought to the attention of American inventors, and (2) the ideas of inventors of potential military use are received by the council and after being sifted are referred to the appropriate military agencies.

Maj. Gen. Henry S. Aurand, director of Research and Development Division, War Department, testified before the Senate Committee on Commerce (May 21, 1947, p. 77), and gave statistics about the National Inventors Council. Between 1940 and 1946, the council received over 360,000 cases. Of these, 204,000 were evaluated and 14,000 interviews were given. Of these, 8,000 were recommended to the Army and Navy, 750 were tested, and 107 accepted for production and use.

The National Inventors Council was given statutory authority under Public Law 776, which established the Office of Technical Services (discussed supra). This law provided for continuation of the functions relating to the reference to the armed services of all scientific or technical information having an immediate or potential practical military value or significance. Public Law 776 provided for further reference of information to the heads of other Government agencies in cases where such information related to activities within the primary responsibility of such agencies.

V. SMITHSONIAN INSTITUTION

A. BACKGROUND

On June 27, 1829, James Smithson, an Englishman, died at Genoa, Italy. His will stated that in the event his nephew had died and had no heirs, Smithson's money was to go to the United States:

> I then bequeath the whole of my property * * * to the United States of America, to found, at Washington, under the name of the Smithsonian Institution an establishment for the increase and diffusion of knowledge among men.[51]

[51] House Select Committee on the Smithsonian Bequest, H. Rept. 277, 26th Cong., 1st sess. (1840). The reports by this House committee are hereinafter cited as "Smithsonian bequest."

In 1836 the U.S. Congress passed a bill providing that the President through agents should "assert and prosecute" a case in the English Court of Chancery for this country's right to the Smithson legacy. Section 3 of this act of July 1, 1836, stated:

> And be it further enacted, that any and all sums of money, and other funds, which shall be received for, or on account of, the said legacy, shall be applied in such manner as Congress may hereafter direct, to the purpose of founding and endowing at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men; to which application of the said moneys, and other funds, the faith of the United States is hereby pledged.

The United States received the legacy on September 1, 1838. On December 10, 1838, President Van Buren urged congressional attention to the fact that no effort had been made to use the fund for an institution. Thereafter, many legislative proposals were made concerning the best way of achieving "the increase and diffusion of knowledge among men." These bills for the establishment of the Smithsonian Institution will be considered here.

B. BILLS PROPOSING ESTABLISHMENT OF THE SMITHSONIAN INSTITUTION (1839–1845)

1. S. 292, REPORTED FEBRUARY 18, 1839 (MR. ROBBINS); H.R. 1161, REPORTED FEBRUARY 16, 1839 (MR. JOHN QUINCY ADAMS)—25TH CONGRESS

The Senate and the House of Representatives in January 1839 passed a resolution setting up a joint committee on the Smithsonian bequest.[52] S. 292 and H.R. 1161, which were reported from this committee, provided for administration of the Smithsonian fund by nine trustees, who were "to prepare * * * a charter of incorporation, and * * * a plan of an institution for the increase and diffusion of knowledge among men." The bills included no directives as to the type of institution.

On February 25, 1839, S. 292 was laid on the table by a vote of 20 in favor and 15 opposed.[53] No action was taken on H.R. 1161.

2. S. 293, REPORTED FEBRUARY 18, 1839 (MR. ROBBINS); H.R. 1160, REPORTED FEBRUARY 16, 1839 (MR. ADAMS)—25TH CONGRESS

S. 293 and H.R. 1160, which were reported from the joint committee, called for the establishment of a board of trustees for the Smithsonian fund and provided:

> And be it further enacted, that no part of the said Smithsonian fund, principal or interest, shall be applied to any school, college, university, institute of education, or ecclesiastical establishment (sec. 4).

Only the interest from the Smithsonian fund was to be spent for the institution (sec. 5), and $30,000 was to be used for the establish-

[52] Congressional Globe, 25th Cong., 3d sess., pp. 113, 115
[53] Id. at p. 216.

ment of an astronomical observatory which would publish its observations and a nautical almanac (sec. 6).

No action was taken on either bill.

3. H.R. 1, MARCH 5, 1840 (MR. ADAMS)—26TH CONGRESS

H.R. 1 differed from H.R. 1160 (25th Cong.) in that it provided for additional trustees and established a board of visitors for inspection of the institution.

The report on H.R. 1 [54] opposed using the fund to establish an educational institution, stating that the Government should not compete with existing private institutes, that there was already a college in Washington, and that the States should govern the teaching of children (p. 16). The committee felt that the fund should not be limited to the establishment of an observatory, but that an observatory was a good beginning (p. 18). The House of Representatives took no action on H.R. 1.

4. H.R. 386, REPORTED APRIL 12, 1842 (MR. ADAMS)—27TH CONGRESS

H.R. 386, which was almost identical to H.R. 1 (26th Cong.), contained additional sections providing for equipment and a library for the observatory. It differed from the bills above as to appointment of trustees.

Although H.R. 386 was reported from the select committee,[55] no action was taken on it.

5. S. 245, FEBRUARY 11, 1841 (MR. LINN)—26TH CONGRESS

Section 1 of S. 245 provided for the appointment of trustees, while section 3 stated that the National Institute of Washington would nominate certain officers of the institution and would exercise general supervisory power. Section 4 read:

> The buildings for said institution shall be erected thereon, (on the Mall) and in which shall be preserved the philosophical instruments, apparatus and collections, necessary to promote the objects of the institution. And all collections of works of art and of natural history, owned by the United States, not otherwise assigned, shall be deposited in said buildings. * * *"

On February 17, 1841, S. 245 was reported from the Committee on the Library by Senator William C. Preston, but no further action was taken.

6. S. 259, REPORTED FEBRUARY 17, 1841 (MR. PRESTON)—26TH CONGRESS; S. 224, REPORTED APRIL 11, 1842 (MR. PRESTON)—27TH CONGRESS

S. 259 and S. 224 gave the National Institute of Washington even greater power over the Smithsonian Institution than was provided in S. 245 (26th Cong.). The National Institute was to elect the Smithsonian's officers (sec. 1), and its superintendent was to govern the institution (sec. 2). Section 4 provided for the assignment of Government collections to the Smithsonian Institution.

[54] Smithsonian bequest, 26th Cong., Report 277 (1840).
[55] Smithsonian bequest, 27th Cong., Report 587 (1842).

Both S. 259 and S. 224 were reported from the Committee on the Library, but no further action was taken on S. 259. S. 224 was considered in the Senate on July 18, 1842, and ordered to lie on the table.[56]

7. S. 188, REPORTED JUNE 7, 1844 (MR. TAPPAN)—28TH CONGRESS [57]

S. 188, which was reported from the Committee on the Library, set up a Board of Managers to govern the Institution (sec. 2) and did not contain any provision for an extensive library. The bill provided for grounds for horticulture and agriculture (sec. 3) and for the distribution of the agricultural products resulting from the Institution's experiments (sec. 8). Section 7 stated that there would be professors in those scientific subjects not commonly taught in universities.

No action was taken on S. 188.

8. S. 18, DECEMBER 12, 1844 (MR. TAPPAN)—28TH CONGRESS

S. 18 also was similar to the act of August 10, 1846, infra, although it contained no specific appropriation for a library. It provided that the Institution should have the results of experiments and other scientific material published. Section 8 minutely prescribed the topics on which the professors would lecture.

S. 18 was reported from the Joint Committee on the Library without amendment on December 16, 1844.[58] On December 31, 1844, Senator Rufus Choate offered an amendment to the bill, which placed great emphasis on a library and made provision for the printing of certain lectures.

Discussion of S. 18 was held in the Senate on January 8 and 9, 1845.[59] On January 16, 1845, Senator Tappan reported to the Senate a substitute bill which provided for a large library containing works in all fields. Duscussion of this amended bill was taken up on January 21, 1845. Senator Levi Woodbury felt that the Smithsonian Institution should be under the control of the National Institute, and he proposed an amendment to that effect. The Woodbury amendment was rejected by the Senate (pp. 162–165) and on January 27, 1845, the Senate passed S. 18 (p. 179).

S. 18 was read in the House of Representatives on January 28, 1845,[60] and on February 10, 1845, Representative Robert D. Owen submitted an amendment which was quite similar to the bill but provided for a school for common schoolteachers. S. 18 was laid aside by the House on March 3, 1845.[61]

C. ACT OF AUGUST 10, 1846

1. H.R. 5, DECEMBER 19, 1845 (MR. OWEN)—29TH CONGRESS

H.R. 5 in its original form closely resembled the final bill (see infra), except that it contained provisions for a normal school (sec. 7) and for the publication of certain findings (sec. 10).

[56] Senate Journal, 27th Cong., 2d sess., p. 474.
[57] The congressional bills introduced and considered in the 28th and 29th Congresses closely approximated the Smithsonian bill as finally passed. For this reason only those provisions of the proposals which distinguish them from the final act are reported here.
[58] Congressional Globe, 28th Cong., 2d sess., p. 32.
[59] Congressional Globe, 28th Cong., 2d sess., pp. 105–107, 115–117, app. pp. 62–65.
[60] H.R. Journal, 28th Cong., 2d sess., p. 274.
[61] Congressional Globe, 28th Cong., 2d sess., p. 395.

2. REPORTS AND ACTION IN CONGRESS

On February 28, 1846, the select committee reported out a substitute but it differed little from the original proposal.[62] Congressman William J. Hough also introduced an amendment on April 21, 1846.

The House of Representatives discussed H.R. 5 on April 22, 23, and 28, 1846.[63] On April 29, 1846, the section providing for publication of certain lectures and for the granting of prizes for outstanding essays was stricken from the bill (p. 749). The House, by a vote of 72 to 42, also voted down section 7, which set up a normal school (p. 748). The House then agreed to the amended bill and passed it by a vote of 85 yeas and 75 nays (p. 750).

H.R. 5 was read in the Senate on April 30, 1846,[64] and on June 1, 1846, Senator John A. Dix reported it from the select committee with amendments (S. Journal, 320). The Senate passed H.R. 5 by a vote of 26 yeas and 13 nays on August 10, 1846 (S. Journal, 519). On the same day President Polk signed the bill, thus establishing the Smithsonian Institution.

3. PROVISIONS OF THE ACT

The act of August 10, 1846, provided that the President, the Vice President, the Secretaries of State, Treasury, War, and Navy, the Postmaster General, the Attorney General, the Chief Justice, the Commissioner of Patents, and the Mayor of Washington would form the Smithsonian Institution (sec. 1). Smithson's legacy of $515,169 was lent to the Treasury at a 6-percent rate of interest, dating from September 1, 1838. The interest accrued by July 1, 1847, which would amount to $242,129, was to be used for construction of the Smithsonian buildings, and the interest received thereafter was "hereby appropriated for the perpetual maintenance and support of said institution" (sec. 2). Section 3 provided that the regents should consist of the Vice President, the Chief Justice, the Mayor of Washington, three Senators appointed by the President of the Senate, three Representatives appointed by the Speaker of the House, and six other persons appointed by joint resolution of the Senate and the House, two of whom were to be members of the National Institute. The Senators were to serve for their Senate terms, the Representatives for 2 years, and the others, whose terms were staggered, for 6 years. The regents would elect from themselves a Chancellor of the Smithsonian Institution, a secretary of the Board, and a three-member executive committee. These groups would be responsible for approval of expenditures, but the Board was required to submit reports to Congress.

A site was to be chosen for the Smithsonian Institution (sec. 4), and the building was to be large enough to house extensive collections (sec. 5).

Section 6 stated:

> That, in proportion as suitable arrangements can be made for their reception, all objects of art and of foreign and curious research, and all objects of natural history, plants,

[62] Smithsonian bequest, 29th Cong., Report 370 (1846).
[63] Congressional Globe, 29th Cong., 1st sess., pp. 710-716, 718-720, 737-738, app. pp. 851, 891-894.
[64] Senate Journal, 29th Cong., 1st sess., p. 269.

> and geological and mineralogical specimens, belonging, or hereafter to belong, to the United States, which may be in the city of Washington, in whosesoever custody the same may be, shall be delivered to such persons as may be authorized by the board of regents to receive them, and shall be arranged in such order, and so classed, as best (to) facilitate the examination and study of them * * *.

The Institution was to acquire new material through gifts and through "exchange of duplicate specimens."

The secretary of the board of regents would serve as "librarian" and "keeper of the museum" (sec. 7). Section 8 provided for meetings of the members and honorary members. It also stated:

> And the said regents shall make, from the interest of said fund, an appropriation, not exceeding an average of $25,000 annually for the gradual formation of a library composed of valuable works pertaining to all departments of human knowledge.

Section 10 read:

> And be it further enacted, that the author or proprietor of any book, map, chart, musical composition, print, cut, or engraving, for which a copyright shall be secured under the existing acts of Congress, or those which shall hereafter be enacted respecting copyrights, shall, within 3 months from the publication * * * deliver, or cause to be delivered, one copy of the same to the librarian of the Smithsonian Institution, and one copy to the librarian of Congress Library, for the use of said libraries.

D. DEVELOPMENT OF THE SMITHSONIAN INSTITUTION

1. CHANGES IN STRUCTURE

The act of August 10, 1846, formed the basis for the establishment of the Smithsonian Institution, but subsequent legislation greatly enlarged the Institution's functions, although leaving its structure largely unchanged. The only significant changes in structure lay in provisions for the appointment of regents. The provisions of section 3 of the act of August 10, 1846, were changed by the act of January 10, 1865, which repealed the requirement that two of the regents be members of the National Institute, and by the act of March 20, 1871, which substituted the Governor of the District of Columbia for the Mayor of Washington as a regent. The act of March 12, 1894, further changed the membership of the Board of Regents so that it now consists of the Vice President, the Chief Justice, three Senators, three Representatives, and six other persons, two of whom are from Washington and the others from different States.

2. GROWTH

Throughout the years the collections and the facilities of the Smithsonian Institution have grown, and new buildings have been constructed. As of June 30, 1958, the Smithsonian Institution had ten branches: the Astrophysical Observatory, the Bureau of American

Ethnology, the Canal Zone Biological Area, the Freer Gallery of Art, the International Exchange Service, the National Air Museum, the National Collection of Fine Arts, the National Gallery of Art, the National Zoological Park, and the United States National Museum. Legislation relating to the establishment of these branches is considered below.

a. General expansion

The collections of the Smithsonian Institution were increased by the act of March 3, 1879, which provided:

> All collections of rocks, minerals, soils, fossils, and objects of natural history, archaeology, and ethnology, made by the Coast and Geodetic Survey, the Geological Survey, or by any other parties for the Government of the United States, when no longer needed for investigations in progress shall be deposited in the National Museum.

The act of April 10, 1928, made provision for the cooperation of the Smithsonian Institution in ethnological research. Section 2 read in part:

> That at such time as the Smithsonian Institution is satisfied that any State, educational institution, or scientific organization in any of the United States is prepared to contribute to such investigation and when, in its judgment, such investigation shall appear meritorious, the Secretary of the Smithsonian Institution may direct that an amount from this sum ($20,000 appropriated from Treasury funds) equal to that contributed by such State, educational institution, or scientific organization, not to exceed $2,000, to be expended from such sum in any one State during any calendar year, be made available for cooperative investigation * * *.

The scope of this ethnological research was extended by the act of August 22, 1949. The act of August 15, 1949, provided for similar cooperation by the Smithsonian Institution in paleontological investigations.

b. National Zoological Park

The act of April 30, 1890, gave control of the National Zoological Park to the Smithsonian Institution.

c. National Gallery of Art

On December 22, 1936, Andrew W. Mellon, through the A. W. Mellon Educational and Charitable Trust, offered the United States his collection of paintings and sculptures and sufficient funds to construct a National Gallery of Art. His offer also included an endowment fund, later set at $5 million, "the income from which shall be used to pay the annual salaries of a director, assistant director, secretary, and curators of the gallery, and for future art acquisitions." [65]

In both Houses of Congress proposals were introduced to set up a National Gallery of Art as a bureau of the Smithsonian Institution in

[65] Letter from A. W. Mellon to President Franklin D. Roosevelt, Dec. 22, 1936. Quoted in hearings on H.J. Res. 27, before the House Committee on the Library, 75th Cong., 1st sess., pp. 1–3 (1937).

accordance with Mr. Mellon's terms. In the House of Representatives hearings were held on House Joint Resolution 217 on February 17, 1937, before the Committee on the Library.[66] The Senate Committee on Public Buildings and Grounds held hearings on Senate Joint Resolution 73, a similar resolution, on February 19, 1937.[67] The same persons testified before both committees, and the testimony given was favorable to the legislative proposals.

The act of March 24, 1937, which established the National Gallery of Art, was almost identical to House Joint Resolution 217 and Senate Joint Resolution 73. Section 1 of the act gave the site on the Mall to the Smithsonian Institution and provided for the building of the gallery by the A. W. Mellon Educational and Charitable Trust. Section 2(a) set up a Smithsonian Bureau under the control of a Board, the trustees of the National Gallery of Art. This Board consisted of the Chief Justice, the Secretaries of State and the Treasury, the Secretary of the Smithsonian Institution, ex officio, and five private citizens. The Board was to appoint a director, an assistant director, a secretary, and a chief curator (sec. 4(c)) and was to be responsible only to the courts (sec. 4(d)). Section 5(b) provided for carrying out Mr. Mellon's intention of maintaining a high quality of works in the gallery. The Board was to make an annual report to the Smithsonian Institution (sec. 5(d)). Section 6(c) stated that the existing National Gallery of Art would be called the National Collection of Fine Arts.

d. Smithsonian Gallery of Art

The Smithsonian Gallery of Art was established by the act of May 17, 1938. Section 1 provided for land for housing its collections. Section 3(c) stated that the gallery would be "under the supervision and control of the Regents and the Secretary of the Smithsonian Institution." Section 4(a) expressed the purposes and the functions of the gallery, which included maintaining a high standard of art objects for exhibit.

Section 4(b) contained an unusual provision reading as follows:

> (b) In order to encourage the development of contemporary art and to effect the widest distribution and cultivation in matters of such art, the Regents are hereby authorized to solicit and receive funds from private sources, to acquire (by purchase or otherwise) and sell contemporary works of art or copies thereof, to employ artists and other personnel, award scholarships, conduct exhibitions, and generally to do such things and have such other powers as will effectuate the purposes of this subsection.

Section 5 provided that works of art from certain other sections of the Government were to be given to the gallery. Section 6 stated that the Regents and Secretary of the Smithsonian Institution were to approve the gallery exhibitions. A Director of the gallery and other officers were to be appointed by the Regents (sec. 7), and Congress was to make annual appropriations for administration of the gallery (sec. 8).

[66] Id. at p. 54.
[67] 75th Cong., 1st sess. (1937).

e. Canal Zone Biological Area

The act of July 2, 1940, as amended by the 1946 Reorganization Plan No. 3, gave control of the Canal Zone Biological Area to the Smithsonian Institution.

Section 2 stated:

> The purpose of setting aside such an area is to preserve and conserve its natural features, including existing flora and fauna, in as nearly a natural condition as possible, thus providing a place where duly qualified students can make observations and scientific investigations for increase of knowledge, under such conditions and regulations as may be prescribed by the Smithsonian Institution.

f. National Air Museum

The act of August 12, 1946, established the National Air Museum as a bureau of the Smithsonian Institution. It read in part as follows:

> SEC. 1 (a). There is established under the Smithsonian Institution a bureau to be known as a national air museum, which shall be administered by the Smithsonian Institution with the advice of a board to be composed of the Commanding General of the Army Air Forces,[68] or his successor, the Chief of Naval Operations, or his successor, the Secretary of the Smithsonian Institution, and two citizens of the United States appointed by the President from civilian life, who shall serve as such members without compensation. * * *
>
> SEC. 2. The national air museum shall memorialize the national development of aviation; collect, preserve, and display aeronautical equipment of historical interest and significance; serve as a repository for scientific equipment and data pertaining to the development of aviation; and provide educational material for the historical study of aviation.

The executive departments of the Government were to give their aviation collections to the Museum (sec. 5). The head of the Museum was to be appointed by the Secretary of the Smithsonian Institution (sec. 1(b)).

It can thus be seen by examining the legislation which set up new bureaus and special projects for the Smithsonian Institution, that not only its physical facilities, but also its objectives and its functions have expanded since 1846.

VI. NATIONAL ACADEMY OF SCIENCES AND NATIONAL RESEARCH COUNCIL

A. THE NATIONAL ACADEMY OF SCIENCES

1. ESTABLISHMENT

The National Academy of Sciences was established by S. 555 (37th Cong.), introduced February 20, 1863, by Senator Henry Wilson. Section 1 named those persons who would constitute the Academy,

[68] The act of July 26, 1947, transferred this membership to the Chief of Staff, U.S. Air Force.

which was set up as a "body corporate." Under section 2, the National Academy, consisting of "not more than 50 ordinary members," was authorized to govern itself and was given the power to elect new members. Its actions, however, were to be reported to Congress. Section 3 set forth the duties of the Academy, stating:

> And be it further enacted, that the National Academy of Sciences shall hold an annual meeting at such place in the United States as may be designated, and the Academy shall, whenever called upon by any department of the Government, investigate, examine, experiment, and report upon any subject of science or art, the actual expense of such investigations, examinations, experiments, and reports, to be paid from appropriations which may be made for the purpose, but the Academy shall receive no compensation whatever for any services to the Government of the United States.

Although S. 555 was laid on the table at the time it was introduced,[69] it was reported in its original form to the Senate on March 3, 1863, and passed without discussion (Congressional Globe, pp. 1500–01).

Congressman Benjamin F. Thomas brought S. 555 to the attention of the House on the same day, and the House of Representatives, also without debate, passed the bill (p. 1540). On March 3, 1863, President Lincoln signed S. 555, and the National Academy of Sciences was established under the terms stated above.

2. LEGISLATIVE DEVELOPMENT

On July 14, 1870, the provisions of section 2 of the original act were changed in order to "remove the limitation of the number of ordinary members of said Academy as provided in said act." Minor changes in the Academy's powers were also made in the acts of June 29, 1884, and of May 27, 1914, which related to the holding of trust funds.

3. EARLY ACTIVITIES

The National Academy of Sciences met for the first time in New York on April 22, 1863. There, the Academy was divided into two classes, mathematics and physics, and natural history. Each of these classes contained five sections to which members were appointed. In subsequent sessions of the Academy, papers on scientific subjects were read and discussed.[70]

Probably the main purposes for founding the Academy were to honor capable scientists and to give scientific advice to the Government.[71] In order to carry out the latter function, the Academy appointed many special committees at the request of Congress and the executive departments. These committees carried out varied types of investigation as is shown by the examples below: [72]

> Committee on Weights, Measures, and Coinage, 1863.
> Committee on Magnetic Deviation in Iron Ships, 1863.
> Committee on the Improvement of Greytown Harbor, Nicaragua, 1866.

[69] Congressional Globe, 37th Cong., 1st sess., p. 1155 (1863).
[70] National Academy of Sciences, A history of the first half-century of the National Academy of Sciences 1863–1913, pp. 25–102 (Washington, 1913).
[71] Id. at p. 14.
[72] Id. at pp. 201–205.

Committee on the Transit of Venus, 1871.
Committees on the Restoration of the Declaration of Independence, 1880, 1903.
Committee on the Inauguration of a Rational Forest Policy for the Forested Lands of the United States, 1896.

The number of Government requests decreased somewhat after 1888 and it is important to note that although science was becoming increasingly important, research in later years was being carried on not only by the National Academy, but also by many new scientific organizations. The necessity of coordinating the research of these groups and that of the National Academy was largely met by the founding of the National Research Council,[73] considered infra.

B. THE NATIONAL RESEARCH COUNCIL

1. ESTABLISHMENT

The National Research Council was not established by congressional legislation, but was created as a result of President Wilson's acceptance in April 1916 of an offer by the National Academy of Sciences to bolster America's scientific strength in the light of the impending war. On June 19, 1916, the National Academy of Sciences approved the plan of its Committee on Organization and urged: [74]

> That there be formed a National Research Council, whose purpose shall be to bring into cooperation existing governmental, educational, industrial, and other research organizations with the object of encouraging the investigation of natural phenomena, the increased use of scientific research in the development of American industries, the employment of scientific methods in strengthening the national defense, and such other applications of science as will promote the national security and welfare; (and)
>
> That the Council be composed of leading American investigators and engineers, representing the Army, Navy, Smithsonian Institution, and various scientific Bureaus of the Government; educational institutions and research endowments; and the research divisions of industrial and manufacturing establishments.

President Wilson accepted the plan on July 24, 1916. The National Research Council met for the first time on September 20, 1916, and for 2 years it served the military needs of the country. On May 11, 1918, it was given a more permanent status by Executive Order No. 2859 issued by President Wilson.[75] The order stated:

> The National Research Council was organized in 1916 at the request of the President by the National Academy of Sciences, under its congressional charter, as a measure of national preparedness. The work accomplished by the

[73] Detlev W. Bronk, News Report, National Academy of Sciences, National Research Council, vol. 1 (January-February 1951).
[74] "Preliminary Report of the Organizing Committee," proceedings, National Academy of Sciences, vol. 2, p. 508 (August 1916). (Quoted in National Research Council Consolidated Report upon the "Activities of the National Research Council, 1919–32," pp. 5–6, prepared in the Office of the Permanent Secretary with the assistance of the Chairman of Divisions of the Council (Washington, 1932).)
[75] "Consolidated Report Upon the Activities of the National Research Council 1919–32," pp. 6–7.

> Council in organizing research and in securing cooperation of military and civilian agencies in the solution of military problems demonstrates its capacity for larger service. The National Academy of Sciences is therefore requested to perpetuate the National Research Council * * *.[76]

2. RELATIONSHIP TO THE NATIONAL ACADEMY OF SCIENCES

Since 1918 the National Academy of Sciences and the National Research Council have been so closely connected that it is impossible to consider the activities of each separately. The relationship between the two is well summarized in the National Research Council's publication on its organization and members:

> The members of the Academy are in effect the trustees of the organization and the National Research Council provides the means through which scientists and engineers throughout the country participate in its activities. * * * The Academy bears the full contractual and fiscal responsibility for the Academy—Research Council.[77]

The National Academy of Sciences appoints the members of the National Research Council, most of whom have been nominated as representatives by American scientific organizations. In addition, there are members at large and Government members, who were originally appointed in accordance with President Wilson's Executive order of May 11, 1918:

> To this end representatives of the Government, upon the nomination of the National Academy of Sciences, will be designated by the President as members of the Council, as heretofore, and the heads of the Departments immediately concerned will continue to cooperate in every way that may be required.[78]

On May 10, 1956, this procedure was amended by Executive Order No. 10668, which provided:

> The Government shall be represented on the Council by members who are officers or employees of specified departments and agencies of the executive branch of the Government. The National Academy of Sciences shall specify, from time to time, the departments and agencies from which Government members shall be designated, and shall determine, from time to time, the number of Government members who shall be designated from each such department and agency. The head of each such specified department or agency shall designate the officers and employees from his department or agency, in such numbers as the National Academy of Sciences shall determine, who shall be members of the Council, but shall designate only those persons who are acceptable to the Academy.

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[76] Id. at pp. 7-8.
[77] National Research Council, "Organization and Members 1955-56," p. 2 (Washington, 1955).
[78] Quoted in "Consolidated Report Upon the Activities of the National Research Council, 1919-32," p. 8.

> This order shall not be construed as terminating the tenure of any person who has heretofore been designated as a member of the Council.[79]

The National Research Council thus has a broader range of membership than the National Academy and is able to coordinate and utilize the research facilities of the principal scientific organizations, educational institutions, and industrial laboratories. The work of the Academy-Research Council is supported in part by private donations, such as the endowment fund given by the Carnegie Corp., and in part by contracts with the Government, foundations, and nonprofit organizations entered into for the purpose of carrying out specific projects.[80]

3. ORGANIZATION

As originally organized, the National Research Council was composed of a Research Information Service, seven divisions dealing with the different sciences, and five divisions dealing with the scientific sections of the Federal and State Governments and international, educational, and industrial organizations.[81] The organization of the Council has gradually changed.

As of December 1958, its setup was as follows:

Office of International Relations.
Office of Scientific Personnel.
Divisions:
- Anthropology and Psychology.
- Biology and Agriculture.
- Chemistry and Chemical Technology.
- Earth Sciences.
- Engineering and Industrial Research.
- Mathematics.
- Medical Sciences.
- Physical Sciences.

Each of these divisions contains many committees, and persons outside the National Research Council are called upon to serve on them. There are also smaller units, such as the Space Science Board, which report directly to the Governing Board of the Academy-Research Council.[82]

4. PATENT POLICY

The National Research Council in 1924 decided upon the following policy for dealing with inventions resulting from its research:

> Moved: That in the event patentable discoveries are made in the course of work carried on under the auspices of the National Research Council, it is expected that the Fellows or others, on the approval of the Research Council which will defray the cost, will apply for patents on such discoveries as should be protected in the interests of the public and that such patents will be assigned to the National Research Council, and further

[79] 21 Fed. Reg., p. 3155.
[80] R. L. Zwemer, "The National Academy of Sciences and the National Research Council." Science, vol. 108, pp. 234–238 (Sept. 3, 1948).
[81] "Consolidated Report Upon the Activities of the National Research Council, 1919-32," p. 9.
[82] National Research Council.

> That the National Research Council hereby declares its intention to dedicate to the use of the public, in such manner as the Research Council may deem most effective, the results of such discoveries as are made in the course of investigations conducted under the auspices of the Research Council.[83]

The patent policy adopted in 1924 is still in effect. Several patents have been assigned to the National Research Council under this policy.[84]

5. ACTIVITIES OF THE ACADEMY-RESEARCH COUNCIL

The activities of the Academy-Research Council are many and varied. It awards scientific fellowships and helps in the administration of the fellowships of the National Science Foundation. It undertakes research projects at the request of Government agencies and has served in an advisory capacity to other organizations. Its committees are engaged in many types of research, the results of which are often published. The Academy-Research Council also publishes the Proceedings of the National Academy of Sciences and the News Report; these, in addition to its lecture series, help promote its relations with the general public.[85]

The operations of the Academy-Research Council are even better shown by its achievements, a few of which will be mentioned here. From 1922 to 1930, the Research Council worked on the preparation of the International Critical Tables of Numerical Data of Physics, Chemistry and Technology. It assisted in the plans for a scientific exposition at the Chicago World's Fair in 1933, and the Division of Medical Sciences studied the problem of deafness, following a 1924–25 survey of schools for the deaf by the Division of Educational Relations. The Division of Engineering and Industrial Research has carried out many special projects, including an investigation in the 1920's of damage to the dikes in San Francisco Bay and work in highway research. In addition, this division has sponsored laboratory tours for industrial representatives and has carried out surveys of industrial research.[86]

During the early years of World War II, the Academy-Research Council made a survey of research facilities available for war use. At the request of the Government many projects were carried out during the war, including those on "military medicine involving extensive cooperation with the Committee on Medical Research, food and nutrition, research on critical metals and other materials, and certain problems of actual warfare, many of them highly confidential." [87]

The activities of the Academy-Research Council have continued to expand following the war. A National Committee of the International Union Against Cancer was organized, as well as a Committee on Disaster Studies, which made an investigation in Europe at the time of the 1953 floods. A special Academy committee studied the National Bureau of Standards' findings on battery additive AD–X2,

[83] U.S. Department of Justice, Investigation of Government Patent Practices and Policies: Report and Recommendations of the Attorney General to the President, vol. II, p. 223 (1947).
[84] National Research Council.
[85] Report of the National Academy of Sciences, National Research Council, fiscal year 1953–54.
[86] Consolidated report upon the activities of the National Research Council 1919–32, pp. 24–29, 72–75, 115–126.
[87] Zwemer, note 80, supra, at p. 237.

and the Division of Medical Sciences has studied the after effects of the atomic bomb explosions in Japan.[88]

The U.S. National Committee for the International Geophysical Year was established by the Academy-Research Council. The Council also assumed direction of the United States World Data Center.[89]

The achievements reported above show only a few of the research projects and activities undertaken by the National Research Council, in carrying out the aims prescribed for it in its "Articles of Organization":

> It shall be the purpose of the National Research Council to promote research in the mathematical, physical, and biological sciences, and in the application of these sciences to engineering, agriculture, medicine, and other useful arts, with the object of increasing knowledge, of strengthening the national defense, and of contributing in other ways to the public welfare, as expressed in the Executive Order of May 11, 1918 (art. I).[90]

VII. NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

On October 1, 1958, the National Advisory Committee for Aeronautics was absorbed into the new National Aeronautics and Space Administration, and its independent existence came to an end.

A. BILLS PROPOSING RESEARCH IN AERONAUTICS—PRIOR TO 1915

Although proposals for an Advisory Committee for Aeronautics were not introduced until 1915, three bills prior to that date provided for research in aeronautics.

S. 8402 (Mr. Stone) and H.R. 28679 (Mr. Peters), were introduced in the 62d Congress on February 7, 1913.

S. 8402 and H.R. 28679 proposed establishment of a National Aeronautical Laboratory which was to be under the supervision of the Board of Regents of the Smithsonian Institution (sec. 1). Section 2 set forth the duties of the Laboratory as follows:

> That the functions of the Laboratory shall be the study of the problems of aeronautics, with such research and experimentation as may be necessary to increase the safety and effectiveness of aerial navigation for the purpose of commerce and national defense.

The Laboratory was to work for the Government and also for private concerns, who would pay the costs of the research (sec. 3); it was to make public the results of its experiments through "bulletins for public distribution" (sec. 7). Section 8 established an aeronautical committee, composed of the Laboratory's director, an aeronautical officer from the War Department and one from the Navy Department, the Secretary of the Smithsonian Institution, the Chief of the Weather Bureau, the Chief of the U.S. Bureau of Standards, and seven other persons acquainted with the field, three of whom were to be from

[88] British Commonwealth Scientific Office, North America. Notes on science in U.S.A. 1954, pp. 4-5 (London, Her Majesty's stationery office, 1955).
[89] National Science Foundation, Eighth Annual Report, 1958, pp. 93, 94.
[90] Quoted in consolidated report upon the activities of the National Research Council 1919-32, p. 9.

the District of Columbia. In explaining the duties of the aeronautical committee, section 8 stated:

> The aeronautical committee shall advise in relation to the work of the Laboratory and the coordination of its activities with those of other governmental and private laboratories in which questions concerned with the study of the problems of aeronautics can be experimentally investigated.

Both S. 8402 and H.R. 29679 were referred to the Committees on the Library, but no further action was taken.

H.R. 3401, April 21, 1913 (Mr. Sharp), 63d Congress. H.R. 3401 provided:

> That a Commission is hereby established for the purpose of acquiring information relative to the development of aviation both in America and the European countries. Said Commission shall be composed of three persons familiar with this subject, to be appointed by the President of the United States, one of whom shall be an officer of the Regular Army, one an officer in the Navy, and one a civilian.
>
> The Commission shall be comprised of at least one skilled aviator and one aeronautical engineer.
>
> SEC. 2. That the duties of said Commission shall be to visit and personally inspect, when feasible and proper, the establishments where the various types of aircraft are manufactured, aerodynamic laboratories devoted to testing such apparatus, aeronautic schools and their methods of instruction, the methods of organizing such corps, aviation fields, witnessing flights when convenient, and ascertaining where possible all the information having to do with the latest improvements in the development of aviation as it concerns its use in war, commerce, and furthering scientific knowledge.

Within 6 months the Commission was to report its findings and its recommendations to Congress.

H.R. 3401 was referred to the Committee on Military Affairs. No further action was taken on it.

B. BILLS PROPOSING AN ADVISORY COMMITTEE FOR AERONAUTICS (63D CONGRESS)

1. SENATE JOINT RESOLUTION 229, JANUARY 26, 1915 (MR. TILLMAN); SENATE JOINT RESOLUTION 235, JANUARY 26, 1915 (MR. TILLMAN); HOUSE JOINT RESOLUTION 413, FEBRUARY 1, 1915 (MR. ROBERTS)

a. Provisions

Senate Joint Resolution 229, Senate Joint Resolution 230, and House Joint Resolution 413 stated that the United States did not have an advisory committee for aeronautics as did Great Britain, France, and Germany, and that such a lack had caused the United States to fall behind in aeronautical research. The resolutions then went on to explain that—

> under existing law—section 9 of the act approved March 4, 1909 (35 Stat. p. 1027)—it is unlawful for the President

or any Government official to appoint a committee, commission, or board on aeronautics without authorization of Congress.

The resolutions therefore set up an Advisory Committee for Aeronautics of not over 14 members, of whom 2 would be from the Bureau relating to aeronautics in the War Department, 2 from the Bureau on Aeronautics in the Navy Department, 1 each from the Smithsonian Institution, the Weather Bureau, and the U.S. Bureau of Standards, and not more than 7 others (3 from the District of Columbia and the rest from different States). Section 1 then continued:

> *Provided further*, That it will be the duty of the Advisory Committee for Aeronautics to supervise and direct the scientific study of the problems of flight with a view to their practical solution, and to determine the problems which should be experimentally attacked, and to discuss their solution and their application to practical questions. In the event of a laboratory or laboratories, either in whole or in part, being placed under the direction of the Committee, the Committee may direct and conduct research and experiment in aeronautics in such laboratory or laboratories: *And provided further*, that rules and regulations for the conduct of the work of the committee shall be formulated by the Committee and approved by the President.

Section 2 provided for an annual $5,000 appropriation for the next 5 years and stated that the Committee would make an annual report to Congress.

b. Action taken

Senate Joint Resolution 229 and House Joint Resolution 413 were referred to the Committees on Naval Affairs. Senate Joint Resolution 230 was referred to the Committee on Military Affairs.

No further action was taken on Senate Joint Resolution 229 and Senate Joint Resolution 230, but House Joint Resolution 413 was reported, with amendments, from the Committee on Naval Affairs on February 19, 1915.[91] As a result of the amendments, the introductory clauses of the bill explaining the reasons for the legislation were omitted; the Advisory Committee for Aeronautics was to consist of 12 rather than 14 members; and restrictions with respect to the locality from which Committee members were to be chosen, were deleted. The report quoted statements expressing the approval of the Navy Department and the recognition of the need for such a committee by the Board of Regents of the Smithsonian Institution. The Committee on Naval Affairs explained that, in addition to studies outside the Government, the status of aeronautical research was as follows:

> Although the U.S. Government is equipped for doing much of the work of investigation in the development of aviation, there is no correlation of the work of the various governmental agencies. The Bureau of Standards is equipped for

[91] House Committee on Naval Affairs, 63d Cong., 3d sess., National Advisory Committee for Aeronautics, Rept. 1423 to accompany H.J. Res. 413 (February 19, 1915).

> testing of material and structural forms used in aircraft and for standardizing physical instruments used in air navigation. The U.S. Weather Bureau studies and reports on aeronautical meteorology and has an extensive library of works relating to or allied to aeronautics and is equipped with instruments capable of mapping air currents throughout the United States and waters along its coasts. The War and Navy Departments have aeronautical libraries and purchase and equip flying machines for national defense. Each of these departments have attachés in the various countries to report on the development of aviation abroad (p. 1).

It then stated:

> In view of the fact that the establishment of such a committee would be in the line of the best practice of European nations, all of which have made remarkable progress in aviation under the spirit of cooperation of governmental and private agencies and in view of the fact that at present there is no coordination of the agencies, resources, facilities, or activities of the Government in the development of aviation or with private enterprise, the committee recommends the enactment of the joint resolution as amended (p. 2).

No further action was taken on House Joint Resolution 413. On March 3, 1915, however, Congressman Thomas S. Butler stated that the provisions of the resolution were covered in the naval appropriation bill, H.R. 20975, which had been passed by the House.[92] This bill is discussed below.

2. ACT OF MARCH 4, 1915, CREATING THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

a. H.R. 20975, reported January 16, 1915 (Mr. Padgett)

H.R. 20975 in its original form contained an appropriation for aeronautics but no provision for an advisory committee. On February 22, 1915, however, it was reported from the Senate Committee on Naval Affairs with amendments.[93] Among the amendments was one setting up an Advisory Committee for Aeronautics. The proposed membership of the Committee was almost identical to that provided in Senate Joint Resolution 229 (63d Cong.), but there were to be no more than 10 members and the 3 persons not holding specific positions were to be "acquainted with the needs of aeronautical science, either civil or military, or skilled in aeronautical engineering or its allied sciences." One of these members could be from the District of Columbia, while the others were to be from different States. The duties of the Committee were identical to those set forth in Senate Joint Resolution 229.

b. Action taken on H.R. 20975, and enactment thereof

On February 25, 1915, the Senate, acting as Committee of the Whole, approved the amendment establishing the Advisory Committee.[94] On February 26, 1915, the Senate agreed to the amendments

[92] 52 Congressional Record, p. 5461.
[93] 63d Cong., 3d sess., Naval appropriation bill, Rept. 1021 to accompany H.R. 20975, Feb. 19, 1915.
[94] 52 Congressional Record, p. 4601.

it had made as the Committee of the Whole and passed H.R. 20975 (p. 4713).

The House of Representatives on February 27, 1915, agreed to sending H.R. 20975 to conference, as was desired by the Senate (p. 4869). On March 2, 1915, the bill was reported from conference committee.[95] Amendment 10 established the Advisory Committee for Aeronautics. The membership agreed to by the Committee was identical to that provided for in the final act which read:

> An Advisory Committee for Aeronautics is hereby established, and the President is authorized to appoint not to exceed twelve members, to consist of two members from the War Department, from the office in charge of military aeronautics; two members from the Navy Department, from the office in charge of naval aeronautics; a representative each of the Smithsonian Institution, of the United States Weather Bureau, and of the United States Bureau of Standards; together with not more than five additional persons who shall be acquainted with the needs of aeronautical science, either civil or military, or skilled in aeronautical engineering or its allied sciences: *Provided*, That the members of the Advisory Committee for Aeronautics, as such, shall serve without compensation * * *

The remainder of amendment 10 was almost identical to Senate Joint Resolution 229 (63d Cong.) with only minor changes in wording.

On March 2, 1915, the House held debate on the conference report, but there was no discussion of amendment 10. On the same day the conference report was approved by the House (p. 5216).

On March 2, 1915, the conference committee recommendations were read to the Senate (pp. 5137–5138), and on March 3, 1915, after some debate, the Senate agreed to the conference report (p. 5251).

President Wilson signed H.R. 20975 on March 4, 1915 (p. 5523), thus establishing what was later known as the National Advisory Committee for Aeronautics.

C. DEVELOPMENT OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

1. ORGANIZATION AND DUTIES

After 1915 there were several changes in the membership of the Committee effected by amendments enacted March 2, 1929, June 23, 1938, May 25, 1948, August 8, 1950, and June 3, 1954. As of September 30, 1958, the membership section of the statute read:

> There is established a National Advisory Committee for Aeronautics * * * to be composed of not more than seventeen members appointed by the President. Members shall serve as such without compensation, and shall include two representatives of the Department of the Air Force; two representatives of the Department of the Navy, from the office in charge of naval aeronautics; two representatives of the Civil Aeronautics Authority; one representative of the Smithsonian Institution; one representative of the United

[95] 63d Cong., 3d sess. Naval appropriation bill. Conference report to accompany H.R. 20975 making appropriation for the naval service for the fiscal year ending June 30, 1916, and for other purposes (Mar. 2, 1915).

> States Weather Bureau; one representative of the National Bureau of Standards; one Department of Defense representative who is acquainted with the needs of aeronautical research and development; and not more than seven other members selected from persons acquainted with the needs of aeronautical science, either civil or military, or skilled in aeronautical engineering or its allied sciences.

The term of membership for persons other than those representing Government agencies is 5 years.

Throughout the years the organization of the National Advisory Committee for Aeronautics grew, and at the time of its absorption into the National Aeronautics and Space Administration, the members appointed by the President were aided by four major committees: the Committee on Aircraft, Missile, and Spacecraft Aerodynamics, the Committee on Aircraft, Missile, and Spacecraft Propulsion, the Committee on Aircraft, Missile, and Spacecraft Construction, and the Committee on Aircraft Operating Problems. The membership of these committees resembled that of the central committee, in that they were composed of a cross section of persons from Government and from private research. Each committee had subcommittees, and here too the wide range of membership permitted coordination of NACA research with that of other agencies. In addition to these four technical committees, the NACA established an Industry Consulting Committee in 1945 and a Special Committee on Space Technology in January 1958.[96]

A small portion of the NACA's work was done under contract with research and educational institutions, but most of it was done on the NACA grounds and was governed by the needs of national defense. The NACA preserved a close working arrangement with many Government agencies, especially the armed services, in order to avoid duplication of research and to permit maximum use of its findings.[97] For example, the NACA had some of its personnel working at the Atomic Energy Commission laboratories.[98]

The duties of the National Advisory Committee for Aeronautics were likewise enlarged. Under the act of May 25, 1948, it was authorized—

> to direct and conduct research and experiment in aeronautics in the Langley Aeronautical Laboratory, the Ames Aeronautical Laboratory, the (Lewis) [99] Flight Propulsion Laboratory and in such other laboratory or laboratories as may, in whole or in part, be placed under the direction of the Committee.

2. PATENT POLICY

In carrying out its duties, both on its own and under contracts with other institutions, the NACA had to face the problem of rights in inventions resulting from its research. It was subject to the pro-

[96] U.S. National Advisory Committee for Aeronautics, Forty-Fourth Annual Report, 1958, pp. 83-93.
[97] Senate Committee on Armed Services. Report by Ralph E. Flanders on visit to the facilities of the National Advisory Committee for Aeronautics, pp. 1-3 (Apr. 8-13, 1955); U.S. President's Scientific Research Board, science and public policy, a report to the President by John R. Steelman, vol. 2, The Federal research program, pp. 256-261 (1947).
[98] Hearings on H.R. 2581 (H.R. 3761), before the Subcommittee on Real Estate and Military Construction of the Senate Committee on Armed Forces, 84th Cong., 1st sess., pp. 10, 18 (1955).
[99] The word "Lewis" was inserted by the act of Aug. 8, 1950.

visions of Executive Order 10096 (1950).[100] and each employee had to report all inventions he made to the Committee. (See Appendix A.) This contrasted with the earlier policy under which the title to inventions was left with the employees and the Government received royalty-free licenses.[101] The NACA's research contracts contained a clause that the Government would receive a royalty-free, nonexclusive, irrevocable license on any invention made by an employee under the contract.[102]

3. HISTORY AND ACHIEVEMENTS

The growth in the Committee's facilities and operations paralleled the steady rise in importance of aviation, and the role of the NACA can best be seen through a brief summary of its history and achievements.

Shortly after the foundation of the National Advisory Committee for Aeronautics in 1915, a survey was made of the existing aeronautical facilities. The results of the survey were not favorable, and the Committee decided to build its own laboratory at Langley Field, Va. By 1920, a 5-foot wind tunnel had been constructed at the field as well as an aerodynamical laboratory and an engine laboratory. During the 1920's and 1930's the National Advisory Committee for Aeronautics carried on much basic research, emphasizing the testing of airframes rather than engine development.[103]

With the coming of World War II, however, basic research largely gave way to work on specific wartime projects and to testing of military aircraft. The war also made imperative an enlargement of Committee facilities. In 1939, Congress authorized an expansion at Langley Field; in 1940 construction was begun on two new Committee laboratories. The Ames Aeronautical Laboratory at Moffett Field, Calif., was to deal with problems of aerodynamics, while the Flight Propulsion Research Laboratory in Cleveland was concerned with engine research, including the development of jet engines. In 1945, the operations of the Langley Laboratory were still further enlarged as the Pilotless Aircraft Research Station, established on Wallops Island, Va., began experimentation with guided missiles. During the war the NACA personnel staff increased from 523 in 1939 to 6,804 in 1945.[104]

On September 30, 1958, the National Advisory Committee for Aeronautics had a staff of 7,966 scientists and other personnel, and its laboratories and facilities reached a value of approximately $350 million measured in original cost.[105] During fiscal year 1958 the NACA obligated $41 million for construction and equipment and $76 million for salaries and expenses.

During the years following World War II, many aeronautical advances resulted from NACA research. On October 14, 1947, the research airplane Bell X–1 attained supersonic speed, and on November 20, 1953, the Douglas D–558–II flew twice as fast as the speed of sound. In 1950 a transonic wind tunnel went into operation at the

[100] See discussion of Executive Order 10096, supra, at pp. 16–17.
[101] U.S. Department of Justice, Investigation of Government Patent Practices and Policies: Report and Recommendations of the Attorney General to the President, vol. II, pp. 227–235 (1947).
[102] U.S. National Aeronautics and Space Administration.
[103] Robert Schlaifer and S. D. Heron. Development of aircraft engines. Development of aviation fuels; two studies of relations between Government and business, p. 33 (Boston, Harvard University, 1950).
[104] George W. Gray. Frontiers of Flight: the story of NACA research, pp. 9–33, 336.
[105] U.S. National Aeronautics and Space Administration, First Semiannual Report, Oct. 1, 1958, through Mar. 31, 1959, p. 4.

Langley Laboratory.[106] Other postwar accomplishments of NACA aeronautical research were reported in a statement by Senator John C. Stennis on May 5, 1955.[107] These included—

Discovery of a method to increase the speed of the Navy's F9F series of fighter planes.

Development of vertical takeoff and landing planes.

Use of water skis on such airplanes as the Navy's Sea Dart.

Development of afterburners which have been used on the F–84 Republic Thunderjet, F–86 North American Sabre, F–89 Northrup Scorpion, etc.

Methods of conquering the problem of icing on airplanes.

As of June 30, 1958, approximately half of the National Advisory Committee for Aeronautics' research was in the area of missiles and spacecraft. A "waffle grid" design was developed for space vehicles and missiles, and the NACA's blunt-nose design was used on all American ballistic missile warheads. The X–15 airplane, which will be used to gain information on weightlessness and other space travel problems, originated in NACA research.[108]

In conclusion, it may be said that the National Advisory Committee for Aeronautics played a significant and essential role in the development of American aviation. In 1955, Senator Flanders reported: "In the three fields of aerodynamics, powerplants, and aircraft structures, the NACA is the main source of aeronautical research information in this country." [109] It was in recognition of its important role that the National Advisory Committee for Aeronautics was made the nucleus of the National Aeronautics and Space Administration.

VIII. NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

A. BACKGROUND

One of the most recent developments in the attempt to encourage research and development by the U.S. Government, was the establishment of the National Aeronautics and Space Administration. The launching of the first earth satellite, Sputnik I, by the Soviet Union on October 4, 1957, awakened the United States to the urgency of stepping up and coordinating its research in the exploration of outer space. Only hard work and intelligent planning, it was recognized, could overcome this lag in the years ahead.

The Congress responded by holding interim hearings on the Nation's satellite and missile programs. From November 25, 1957, to January 23, 1958, the Preparedness Investigation Subcommittee of the Senate Committee on Armed Services heard approximately 70 experts and written testimony was submitted by about 200 others. On February 6, 1958, the Senate passed Senate Resolution 256, creating a Special Committee on Astronautical and Space Exploration to frame legislation for a national program. And on March 5, 1958, House Resolution 496 was passed by the House of Representatives, establishing a Select Committee on Astronautics and Space Exploration to investigate the problems and submit recommendations.

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[106] U.S. National Advisory Committee for Aeronautics, Forty-Fourth Annual Report, 1958, pp. 26, 94.
[107] "Construction of Aeronautical Research Facilities," 101 Congressional Record, p. 5744.
[108] U.S. National Advisory Committee for Aeronautics, Forty-Fourth Annual Report, 1958, p. 30.
[109] Senate Committee on Armed Services. Report by Ralph E. Flanders on visit to the facilities of the National Advisory Committee for Aeronautics, p. 1 (1955).

On April 2, 1958, President Eisenhower's message to the Congress (H. Doc. 365) relative to space science and exploration proposed the establishment of a strong civilian agency, with the National Advisory Committee for Aeronautics as its nucleus, to direct a national program for outer space. This message read, in part:

> Recent developments in long-range rockets for military purposes have for the first time provided man with new machinery so powerful that it can put satellites into orbit, and eventually provide the means for space exploration. The United States of America and the U.S.S.R. have already successfully placed in orbit a number of earth satellites. In fact, it is now within the means of any technologically advanced nation to embark upon practicable programs for exploring outer space. The early enactment of appropriate legislation will help assure that the United States takes full advantage of the knowledge of its scientists, the skill of its engineers and technicians, and the resourcefulness of its industry in meeting the challenges of the space age.
>
> During the past several months my Special Assistant for Science and Technology and the President's Science Advisory Committee, of which he is the Chairman, have been conducting a study of the purposes to be served by a national space program, of the types of projects which will be involved, and of the problems of organizing for space-science functions. In a statement which I released on March 26, 1958, the Science Advisory Committee listed four factors which in its judgment give urgency and inevitability to advancement in space technology. These factors are (1) the compelling urge of man to explore the unknown; (2) the need to assure that full advantage is taken of the military potential of space; (3) the effect on national prestige of accomplishment in space science and exploration; and (4) the opportunities for scientific observation and experimentation which will add to our knowledge of the earth, the solar system, and the universe.
>
> These factors have such a direct bearing on the future progress as well as on the security of our Nation that an imaginative and well-conceived space program must be given high priority and a sound organization provided to carry it out. Such a program and the organization which I recommend should contribute to (1) the expansion of human knowledge of outer space and the use of space technology for scientific inquiry, (2) the improvement of the usefulness and efficiency of aircraft, (3) the development of vehicles capable of carrying instruments, equipment, and living organisms into space, (4) the preservation of the role of the United States as a leader in aeronautical and space science and technology, (5) the making available of discoveries of military value to agencies directly concerned with national security, (6) the promotion of cooperation with other nations in space science and technology, and (7) assuring the most effective utilization of the scientific and engineering resources of the United States and the avoidance of duplication of facilities and equipment.

The following is a history of the legislation which was enacted to meet this urgent problem of the exploration of outer space. Because of its importance and currency, it is given in some detail.

B. BILLS INTRODUCED AND CONSIDERED—HOUSE OF REPRESENTATIVES

1. H.R. 11881, APRIL 14, 1958 (MR. MCCORMACK), AND COMPANION BILLS—85TH CONGRESS

a. Provisions

This bill was entitled "National Aeronautics and Space Act of 1958." It was declared to be the policy of Congress to make provision for research into flights within and outside the earth's atmosphere for the general welfare and security of the United States; that the activities be directed by a civilian agency exercising control over aeronautical and space research except insofar as such activities pertain to weapons systems or military operation, in which case the agency shall cooperate with the Department of Defense, and that these activities be conducted so as to contribute to one or more of the following objectives: (1) expansion of human knowledge of phenomena in the atmosphere and space, (2) improvement of aircraft, (3) development of space vehicles, (4) preservation of the United States as a leader in aeronautical and space science and technology, (5) making available to defense agencies discoveries that have military value or significance, (6) cooperation with other nations in the space activity and the peaceful application of results, (7) most effective utilization of the scientific and engineering resources of the United States and the avoidance of duplication.

It established the (1) National Aeronautics and Space Agency to be headed by a Director appointed by the President at an annual salary of $22,500, (2) National Aeronautics and Space Board composed of not more than 17 members to be appointed for 4 year terms by the President.

It limited the membership of the Board to be appointed from department or agencies of the Government to eight, one of which must be from the Department of Defense; provided that the remaining members be eminent in fields of science, engineering, technology, education, etc.

Provided that the Board Chairman be designated from time to time by the President.

It required the Board to meet at least four times a year and to advise the President and the Director concerning policies and programs of the Agency.

It required the Director to consult with the Board prior to (1) initiation or substantial modifications of policies or programs of the Agency, (2) appropriation request, (3) establishment of certain units within Agency, (4) appointment by the Director of the heads of these units.

The bill outlined the functions of the Agency to be as follows: (1) develop an aeronautical and space research program; (2) plan, direct, and conduct scientific studies and investigations of manned and unmanned space flight; (3) develop, test, and launch aeronautical and space vehicles; (4) plan scientific measurements and observations

made from space vehicles; and (5) submit an annual report of operations and accomplishments to the President.

It authorized the Agency to (1) make rules, regulations, etc., governing its manner of operation, (2) appoint and employ necessary employees, (3) construct, acquire, maintain, etc., laboratories, testing sites, and other facilities for space vehicles, (4) accept gifts of real and personal property and services, (5) enter into contracts necessary to carry out purposes of the act, (6) use services and equipment of other Federal agencies, (7) appoint consultatory advisory committees, (8) obtain temporary services of experts at $100 per diem, (9) employ alien and retired service officers under certain conditions, (10) enter into cooperative agreement under which members of the Army, Navy, Air Force, and Marines may be detailed for special services, (11) conduct or provide training, and assign employees to research, study, or training, at Federal or non-Federal facilities and, if deemed appropriate, pay in whole or in part the salaries of such employees while in training, (12) authorize employees to attend meetings concerned with functions or activities of the agency, (13) handle claims for damages of $5,000 or less resulting from personal injury, death, or damage to personal property, (14) arrange for security investigations of personnel, and (15) direct officers and employees to carry firearms while in the conduct of official duties.

It permitted the Atomic Energy Commission to authorize access to restricted data by members of the Board or advisory committee members, etc., in the performance of their official duties.

The bill provided penalties for willful violations of security orders. It permitted transfer of related functions to the Agency within 3 years after enactment of this act.

It extinguished the National Advisory Committee for Aeronautics and transferred all property, personnel, etc., pertaining thereto to the National Aeronautics and Space Agency.

It made technical amendments in other Acts corresponding to the purpose of this act.

Five other bills, identical to H.R. 11881, were also introduced on April 14, 1958. These were as follows: H.R. 11882 (Mr. Arends), H.R. 11887 (Mr. Haskell), H.R. 11888 (Mr. Keating), H.R. 11961 (Mr. Frelinghuysen), and H.R. 11964 (Mr. Fulton).

b. Hearings and significant testimony

Hearings on H.R. 11881 were held before the House Select Committee on Astronautics and Space Exploration, April 15 through May 15, 1958.

In general. One point on which the witnesses were in complete agreement was that the exploration of space by the United States was a matter which deserved the highest urgency. The establishment of a national space program was held urgent both for reasons of immediate national defense and to insure that in the long run outer space would be effectively utilized for peaceful purposes. It was felt that the United States was behind the Soviet Union today in its ability to use outer space, and only much hard work and intelligent planning and organization could overcome this lag in the years ahead.

Another point brought out in the hearings was the necessity for coordination of our national space policy at the highest levels of Gov-

ernment with other aspects of our military, foreign, technological, and economic policy. Many felt that science deserved a place in the Cabinet, with suggestions for the creation of a Secretary of Science.

The question of military versus civilian control was answered by the majority of the witnesses in favor of a civilian controlled agency, and that it should be oriented toward the broadest interests of the Nation. A large number of the witnesses stressed that, although the projects which are principally military in character should continue to be carried out by the Department of Defense, every precaution should be taken to insure that scientific and technical contributions extending beyond easily identifiable military requirements continue to be made and to be fully available to the national astronautics organization.

The majority of the witnesses agreed that the new Agency could absorb the present staff and facilities of the National Advisory Committee for Aeronautics, but the responsibilities should be broadened to make policy at the highest national level.

There was almost unanimous sentiment against having a so-called crash program, and it was stressed that only a sustained and intensive effort over many years would bear useful fruit. Also, a sustained flow of money—steady appropriations by the Congress—would be needed: the new national agency not only must meet current high-priority needs, but must foster the very long leadtime, broad-based scientific efforts that must be started now if in 10 and 20 years we hope to be ahead in the field of space exploration. It was suggested that Congress set up standing committees on outer space.

It was emphasized that there must be a liberal policy of freedom of research, and liberal exchange of information. The problems of security of information in the space program are not the same as those of atomic energy in 1946. It was pointed out by many witnesses that instead of having a near monopoly of technical know-how, we lag behind our strongest foreign rival. The hampering restrictions of secrecy should be eliminated as much as possible if all our scientific resources are to be applied successfully. This freedom of information, it was brought out, does not apply only to ourselves, but can play a vital role in directing astronautics toward peaceful applications throughout the world. Most witnesses felt that whatever might be lost by "giving away" information to other countries, would almost certainly be more than offset by the greater interchange of information both at home and abroad that would result if the crippling rules of security were reduced.

The question of patent rights was not discussed at any length in the hearings, but the few times it came up in the testimony has been included in the summation of the witnesses' views.

Space law was discussed in the hearings, and was felt to be necessary to prevent anarchy in the use of outer space. Domestic legislation and international agreements, it was felt, could do much to forestall unnecessary future conflicts.

It was emphasized by the majority of the witnesses that the exploration of outer space was no longer hypothetical and remote, and some of the scientists outlined projects which needed only a go-ahead signal and funds to begin their translation from plan to reality. The greatest need is for the creation of a comprehensive, national step-by-step plan; projects with long leadtimes needing their first component

started now in order that complete systems will be ready later when required. One long leadtime which all witnesses agreed needed particular stress was that of adequate educational support. The scientists and technicians that the astronautics program will require, will take many years to nurture. What we do today will determine the supply of such men and women in the decades ahead.

The foregoing summarizes the main features of the testimony. The ensuing accounts of the statements of specific witnesses, which in toto were quite extensive and covered many features, deal only with their testimony on points relevant to the present discussion, to wit, means of encouraging, facilitating, and coordinating research and development in this area, inventions and patent policy, and related matters such as the effect of security restrictions, need for education, etc. Discussions dealing with the political aspects, technological feasibility, problems of space law, and international agreements with respect thereto—matters that deservedly received much attention—have been omitted.

Specific witnesses included the following:

(1) *Dr. Wernher von Braun*, director, Development Operations Division, Army Ballistic Missile Agency, Huntsville, Ala. (pp. 16–46, 61–81), looking ahead in the program of outer space, said:

> We can meet this challenge only if we appreciate and respect the magnitude of this task and discontinue our unfortunate practice of supporting only such research and development that serves immediate military objectives.
>
> The research and development requirements ahead of us are so vast that there should be no question in anyone's mind about a shortage of workload for any of the qualified development teams. It may be wise to have some overlapping of programs and to instill a bit of competition between teams. However, we must carefully retain the present atmosphere of free and full exchange of information in order to avoid costly duplication of effort and to provide for mutual assistance between teams. Also, our scientists should be free to pursue their efforts without continual worry about a program cancellation putting them out of business and thus destroying the team they have built up. The ABMA record of accomplishment for money spent is full evidence that waste will not occur if the existing well-qualified development teams of the country are kept together and allowed to pursue their goals under competent management in a coordinated program.
>
> The Russians have shown clearly their recognition of the importance of the entire field of rocket-propelled devices leading to space control. They have further shown an understanding of the interrelation between scientific and military programs in the entire field. Vigorous action is required to overcome as quickly as possible the obvious lead which the Russians now enjoy.

Representative Fulton asked:

> Would it help you as a matter of organization to have Congress set up a committee primarily responsible in this particular field so there would be close liaison and policy guidance to you as you carry out your work? Should we in

Congress have a special space committee set up so that we can work with you on a civilian basis, having regard to the military aspects and the scientific aspects, both?

Would that be of help?

Dr. VON BRAUN. Sir, I believe it would be of great help indeed, and mainly for the following reason:

I think there is always the danger in a thing like the present space rush, that after the first excitement is over people might go to sleep again. Thus we may get a lot of money for 1 or 2 years, but then the space program may become ever less important as time goes on, particularly if the Russians do not come up with new surprises.

I think the most important single requirement of a sound national space program is that it be a sustained effort, so that we can really plan ahead, that we will know how much money will be available not only in 1958 but also in 1959, 1960, 1961, and 1962, and we really know that Congress and the American people mean business in taking up the Russian space challenge.

The question of patents was discussed as follows:

The CHAIRMAN (Representative McCormack). Doctor, in the contracts that Redstone makes under your authority for the Department of the Army with any private companies or laboratories—are they private companies, too? Do you make contracts with corporations?

Dr. VON BRAUN. Yes, sir.

The CHAIRMAN. Supposing they make any discoveries, does the Government get the benefit of those discoveries?

Dr. VON BRAUN. Yes, sir; the question of patent rights is tied up in the contract.

The CHAIRMAN. If you have occasion to contract with another company, you can let that other company know of these discoveries that were made?

Dr. VON BRAUN. Yes, sir. Anything that is being patented under a Government contract is Government property.

Representative Sisk asked:

It is your opinion that even though now and for the last few years we have been ahead in this field, unless we accentuate our own program of education, scientific development, that we can fall behind very shortly?

Dr. VON BRAUN. I would say we have been living off our capital in recent years. We are still in the fortunate position of at least not lagging behind them in the research field in general, but I think their momentum is so great that their field of progress in this field is already exceeding ours.

Unless we put more money and effort into basic research also, we may soon fall behind in that field.

Representative Keating asked Dr. von Braun if he would comment on the legislation setting up the new Space Agency.

Dr. VON BRAUN. Yes, sir. I am familiar with the administration bill called the Astronautics and Space Act of 1959.

This act in essence proposes to build the Astronautics and Space Agency around what is presently the National Advisory Committee for Aeronautics.

My personal reaction is that I find myself in basic agreement with this bill. However, I think the success of the Space Agency will greatly depend on the authority vested in it, and I do not believe under the present NACA charter NACA or its legal successor would be quite prepared to handle a program of this magnitude. I strongly believe that it will be necessary to put a few more teeth into the NACA charter to make it capable of handling this space assignment.

On the other hand, if these teeth are really put into the NACA charter, and if NACA would really be handed the money to run an adequate space program, then I could not think of a better solution, or of a more competent nucleus for a space agency.

Mr. KEATING. Could you be any more specific at this point? I realize that it is perhaps too early for you to say, but could you be any more specific about what you mean by "teeth in it?" Do you mean by that there should be provisions in the legislation which this committee should consider?

Dr. VON BRAUN. Sir, to put it in very broad terms NACA, as the name implies, has so far been an advisory committee for aeronautics which means the emphasis has been on "advice."

In addition to furnishing advice NACA has provided research support for projects carried out by the aircraft industry. This work has been performed in NACA's wind tunnels, structural laboratories, propulsion-test facilities, and so forth.

It is my opinion that if the newly formed National Astronautics and Space Agency is really to run a national space program, it must be given enough authority and an adequate managerial staff to centrally administer such a large and costly program. My feeling is that in order to handle this assignment, the National Astronautics and Space Agency would need a charter like that of the Atomic Energy Commission, in lieu of the charter under which NACA presently operates.

Anything short of that would probably not work out so well. After all, there is a tremendous amount of money involved in these projects, and an adequate administration of this program requires a large program management staff as well as a group of executives who can make decisions, which, incidentally, sometimes may be quite painful.

(2) *Rear Adm. Hyman G. Rickover*, Assistant Chief, Bureau of Ships, for Nuclear Propulsion, Department of the Navy (pp. 221–273), when asked about the type of control, replied:

I definitely believe that the organization should be under civilian control. The Defense Establishment is already too large. If you let it keep on growing, soon it will be controlling the entire country. In fact, rather than putting new

agencies in the Defense Establishment, I believe it would be very desirable for Congress to require the Defense Department to justify why it has as many agencies as it does.

One of the great difficulties in running the Defense Establishment is that it is so large. So I definitely would put the new agency under civilian control.

Now that is from an organization standpoint. From a scientific standpoint, I also believe that space is more a civilian than a military matter.

There is today a complete blurring of identity between military and civilian matters. War is now not a matter for the military alone. I am sure you are fully aware that the military is merely the cutting edge of the sword, that all of us, our farms, our factories, our schools, our Government—all of our institutions contribute to the military strength of the country.

* * * * *

Furthermore, if we are ever to have peace in this tortured world of ours, we must make a beginning—we must get away from the purely military applications of space. We must recognize that the marriage of the military and science is proceeding too fully and too strongly; we must attempt to stop this tendency and instead emphasize the peaceful applications of science.

Admiral Rickover submitted the following letter expressing his ideas on patent rights:

U.S. Atomic Energy Commission,
Washington, D.C., May 7, 1958.

Hon. John W. McCormack,
Chairman, Select Committee on Astronautics and Space Exploration, House of Representatives.

Dear Mr. McCormack: At the time of my testimony on April 18, 1958, before your committee you asked that I submit comments for the record on patent provisions for outer space legislation.

Of course I lack the expertness to recommend specific legislative language, but I would like to make some general observations. I believe that one can distinguish clearly between patent rights arising from discoveries made with the expenditure of public money and those which are developed privately. In the case of inventions conceived during the course of a Government contract or similar relationship, strong provision should be made for the patent rights to be vested in the Government. A provision such as this does not freeze patents because the Government has continuously licensed others to use patents in the interest of the country as a whole.

Whenever a private party conceives of an invention or discovery and no Federal funds are involved in the work, he has a rather sacred constitutional right to the exclusive use of his invention or discovery. I do not think that writing a provision in outer space legislation which would

award the Government title to patents developed with the use of Government funds would, in any way, infringe upon this right.

Perhaps some may think that this oversimplifies the matter but I have long felt that the patent provisions of the many laws surrounding Government research work could be simplified to a greater extent.

I do feel strongly that no provision of the law setting up the Space Agency should ever be construed to confer on any individual a right which could in any way impede or restrict the use of relevant technology by our Government for domestic or for international purposes. An unequivocal statement to this effect in the law would be an earnest of our intention to help other nations.

I hope these comments are of help to you.

Sincerely yours,

H. G. RICKOVER,
Rear Admiral, U.S. Navy.

(3) *Rear Adm. John T. Hayward*, Assistant Chief of Naval Operations (Research and Development) (pp. 274–306), agreed with the need for a comprehensive program of research in space sciences and a national space program.

He commented briefly on the Soviet system of awards, saying:

> They also have competition in designs and incentives. The results of people like Djurvich and Alushkin, who have won the Lenin prize four or five times; and that is $3,500 tax free in our country's money.
>
> Of course, they do have a double incentive, as Admiral Rickover said; they either produce or get shot. If they produce, they are rewarded. If they do not, they get shot.

(4) *Dr. John P. Hagen*, Director of the Vanguard Project, Naval Research Laboratory (pp. 307–367), began his testimony as follows:

> It is a great opportunity for me to be here to talk with the committee concerning this bill. I think the work of this select committee arises because the Russian satellite accomplishments brought into focus, and into the public eye, the Soviets' determined national effort and singleness of purpose not only to lead the world in the arts of weaponry, including ballistic missiles, but to base this effort on a broad foundation of education, research, and science and technology with the very obvious purpose of outstripping and perhaps dominating she world we know and the world that is to come. It is also obvious that the Russians have a plan for doing this and are dedicated to the task.
>
> * * * * *
>
> However, before we figuratively leap into space we must learn well the lessons of the past, carefully examine our present needs and bring our resources forward with purpose and utilize them wisely to their maximum potential.
>
> We should revitalize the free spirit of inquiry which is so essential to our democratic way of life. We should investigate rather than fear the unknown and allow freer range of

the long too-dormant pioneering spirit which made our country great. We should also assume a mature attitude toward failures and suggestions which are indeed the price and the reward involved in ventures of great risk.

Representative Metcalf asked:

Dr. Hagen, in your response to some of the questions the chairman was asking about the organization of the Commission, a Director, or these various setups that we can have, I think you made it very clear how in your opinion this should be organized.

But I do not believe you commented on one of the proposals that we have a Secretary of Science and Research in the President's Cabinet. I wonder if you will comment on that.

Dr. HAGEN. Sir, I think it would be a very fine thing for science in this country and, therefore, for the country as a whole, to take such a step.

We are living in a technological age. Our very existence depends upon our continued advance in science and technology. I am sure it will become more so as time goes on. Just as you now have a Secretary of Commerce, I do believe that we would all benefit by giving science the stature of having a Department of Science.

Mr. METCALF. You made some comment about the fact you do not think all the research programs should be removed from the various agencies, but one of the proposals we have is that the Secretary of Science and Research take Commerce, Weather Bureau, Agriculture, the testing for better production of seed grains, all of these things. If the Department of Science and Research is created, would you leave those agencies down there?

Dr. HAGEN. On each one you would have to make an individual decision, but in each one I think you would have to take the bigger pieces.

The point I tried to make earlier is this: that in any one of the other departments, for example, the Defense Department, in order that the Department not become sterile in the field, there must be within it a group concerned with basic science and scientific research. The Department, however, could call on other agencies.

(5) *Dr. Fred L. Whipple*, Director, Smithsonian Astrophysical Observatory, Cambridge, Mass. (pp. 267–389), had the following comments on the status of the new agency:

I feel that we must have an organization of the type you have visualized here with a very high status in the Goverment so that it can operate at a comparable level with the Defense Department and other agencies that are interested in this problem. I think this national space agency should be the coordinating agency for the activities in space research. That does not mean that it should control this activity, but it should be in a position of coordinating. I do not see any agency that is in that position at the present time.

The organization should be at a high level and it should be, I think, independent of the military, not because the military are not competent; they are indeed competent; they are also very conscious of the significance of science in the defense of our country. I have made the statement privately a number of times and I would like to make it publicly here: that since the end of World War II, in my opinion, outside of the academic world there is no group in the United States that is more conscious and appreciative of the significance of science in the future security of our country than is the military. They have gone to great efforts to promote basic science. I think in many cases they have "bootlegged" basic science into their programs because they realized it was necessary and because, until very recently, we had no national organization to fund the basic research that would be of value to them.

But in this particular case, I feel that the space exploration should not be under the control of the military because their objectives are not the same as the objectives of this space agency should be. The interest of the military must center on specific defense equipment. They must, by the nature of their operation, concentrate on shorter range goals than basic research.

I do not think we should consider the problem from the viewpoint that the scientists should be under the control of the Government in exploring space. There are two aspects to this problem, in my opinion: (1) The U.S. Government should give its scientists the opportunity to make the basic explorations that are so important to our future. (2) The U.S. Government should then, of course, adopt policies as to the utilization of space and what is to be done with the scientific results and the instrumentation that result from the program. This point of view is slightly different from the one mentioned this morning.

It is my opinion that there is no better expenditure of the taxpayers' money, for the future of this country, than in basic research. It pays off in the long run with greater dividends than any other expenditure of funds that we make in terms of the future of our country, the future of our ideals, and of our democracy.

That is why I feel so strongly that this national space agency is a vital and important agency for our country.

There would be a great many very tangible and explicit benefits. I do not want to take much time in discussing these but I should like to point out, for example, that weather forecasting, in my opinion, will become a science instead of an art. When it is possible to make observations continuously over the entire earth's surface of cloud coverage, the temperature, the water vapor content above the reflecting surface and the wind, and on a daily basis, the satellites will then provide the information necessary to give us a sound theory of weather. This theory, coupled with the great computing machines to utilize the data and to apply the

44515—60——9

theory in terms of the observations, will make weather forecasting an exact science. I predict that knowledge of weather alone, in its value to the country, will greatly outoutweigh the cost of the entire program.

I think there will be many, many great advantages that will come, as we might say, on the side.

Dr. Whipple stressed the need for freedom of information in research, and presented a report on the damaging effects of the security classification to the progress of science. The losses to the scientists' individual progress and to the general progress of science occur in the following ways:

1. By not being aware of the efforts by others, the scientist fails to contact able men who might give him specific assistance in his own problems.

2. The scientist may waste time solving problems that have already been solved, or proved insoluble. Such unnecessarily wasted effort is devastating to the creative urge.

3. The scientists may lose the inspiration normally attained through broad contact with other scientists in widely diversified fields.

4. The scientist fails to gain new ideas by reading the general scientific literature, particularly in fields somewhat away from his own endeavor. Hence, the cross-fertilization obtained by applying techniques in one area of research into another area is greatly hampered.

5. The scientist tends to concentrate on a narrower field of endeavor and loses breadth of view.

6. Lack of broad contacts makes it much more difficult for the scientist to obtain a quick check on the validity of a new idea or technique. Since only a small percent of new ideas turn out to be of value, he will tend to get into the habit of discarding those new ideas that cannot be checked within his narrow range of information, or worse, of not seeking new ideas.

7. The lack of criticism by others in his subject, and the lack of immediate or possibly even ultimate criticism of his efforts, not only hampers the scientist in obtaining the correct or inspired scientific results, but also leads him to an attitude of less self-criticism and less scientific rigor. There can be no doubt that sometimes the cover of security classification is used to hide inferior scientific contributions.

8. The training of new scientists as graduate students is seriously impaired by security classification.

9. The handling of classified material and the maintenance of security wastes the scientist's time, consumes his energy, and creates nervous tension. This is particularly true for the scientist whose institution does not accept classified contracts or who must, for other reasons, work in relative isolation.

10. The nuisance of security checks on open publication and the complications of classified publications reduce the outflow of a scientist's published contributions.

11. Classified scientific material does not exist for the many scientists who do not work on Government contracts.

(6) *Dr. H. Guyford Stever*, associate dean of engineering, Massachusetts Institute of Technology, chairman, National Advisory Committee on Aeronautics, Special Committee on Space Technology (pp. 389–400), had the following to say about the type of organization which would best handle the problems of astronautics and space exploration:

> Without going into great detail about all the possible organizations proposed to do this job, let me say that, for several reasons, I favor the use of the NACA as a nucleus of a new organization to conduct our nonmilitary work in astronautics and space exploration. In the first place, the NACA laboratories have already done, and are continuing to do, a great deal of work in this field, particularly on the flight techniques. In the second place, NACA's relationship with the National Science Foundation and the National Academy of Sciences is such that they can use the important scientific research capabilities which these two organizations have. In the third place, NACA has longstanding close relationships with the military; there is a great overlap in the military and the nonmilitary uses of equipment for space exploration and experimentation. The new organization can use these well-founded relationships, first, to help the military solve its problem, and, second, to help itself by using military equipment.
>
> It is important to consider this a new organization rather than an expanded NACA, for it must have a capability to contract with industry and academic institutions to perform sizable portions of this program. The NACA does not do this at the present time to the extent that will be necessary in this new activity.
>
> Finally, there is one important point which is fundamental to this entire operation. It has to do with the decentralization of authority and responsibility, once the program is decided upon. In those stages in which we are now, essentially, discovering what our objectives are, what our organization should be, and what general program should be followed, I think it is important to tap all of the ideas from all sources. As we begin to carry out this program, we must continue to tap these ideas from capable organizations and individuals to find out what scientific experiments to perform, and to discover what techniques we should use to carry out scientific experiments into space. But, having decided upon an experiment or a program of experiments, I believe it is essential that responsibility and authority be delegated down to the working, technical level. A very complicated superstructure of detailed technical management within the Government, I believe, has seriously hampered some of our most important projects in space technology to date.
>
> I believe that the leaders within the NACA understand this fundamental requirement for rapid progress in a technical venture.

(7) *Dr. Hugh L. Dryden*, director, National Advisory Committee for Aeronautics (pp. 401–471), described the present functions of the NACA, and presented a detailed description of the research project it was undertaking at present.

He presented the rules of the NACA in regard to patents, as follows:

> Executive Order 10096, issued January 23, 1950, provided for a uniform patent policy for the Government with respect to inventions made by Government employees, and for the administration of such policy. It directed each Government agency to promulgate whatever regulations were necessary to effectuate the order. In compliance with this directive the NACA regulations presently in effect were formulated. A copy of these regulations, issued on October 1, 1951, and entitled "Rules and Regulations Relating to Patentable Inventions of Employees of the National Advisory Committee for Aeronautics," is attached. The President, in Executive Order 10096, named the NACA as one of 10 Government agencies having representation on the Government Patents Board, established by that order.
>
> NACA regulations require that all employees inventions be reported, with full information concerning the circumstances under which they were made. If patent protection is deemed advisable and a prior art search confirms the existence of patentable novelty, a determination regarding the disposition of the rights to the invention is made by NACA, in accordance with the provisions of the Executive Order. If title, or all rights are to be left with the inventor, the concurrence of the Chairman of the Government Patents Board must be obtained. The employee may appeal to the Chairman of the Government Patents Board from a decision made by NACA. The decision of the Chairman upon any such appeal is final.

The rules and regulations referred to by Dr. Dryden are set out in full in appendix A, infra.

(8) *Dr. Arthur Kantrowitz*, director, Avco Research Laboratory, Everett, Mass. (pp. 505–520), felt that in order to keep up with or surpass the Russians we must build a spirit of adventure into our administration of the space program. He said:

> Consider also the tremendous difficulty which faces our Government in distinguishing between the rare enthusiast who is capable of great progress and the technically irresponsible who do their best to imitate these invaluable people. I should like to propose the following philosophy—that the delegation of authority to lead large-scale experiments be made in a manner analogous to the technique employed in the organization of an adventurous business enterprise. That the substitute for capital, in this case, should be the reputation of scientists who are willing to devote themselves to the project in question. In this way, we can achieve the closest identity between authority and responsibility.
>
> Consider, on the other hand, the way that our current administrative decisions concerning great projects are made by scientific advisory committees made up of distinguished

scientists. The membership of these committees cannot, remembering their judicial role, emphasize individuals who have an enthusiasm for the project in question. They, therefore, in their objectivity, record merely the general climate of thinking at the moment and tend to recommend the adoption of unadventurous policies.

The plan I would propose would restrict the activities of such scientific committees to the evaluation of the reputation of those scientists and engineers who are willing and anxious to devote themselves and to pledge their reputations to the achievement of special projects. These scientific committees would thus serve essentially to establish the credit rating of the backers of a project. Note that these backers must be willing to commit their time and reputation to the success of a project, and not just offer their judgment that it is a good or bad idea.

I submit that this type of procedure would give us a far closer coincidence of responsibility and authority than we now have. The formulation of a bold administrative policy in areas of adventurous and expensive research will buy us the speed which is desperately necessary for survival in our time.

(9) *Dr. C. C. Furnas*, chancellor, University of Buffalo (pp. 731–773), cited what he believed to be the five most compelling reasons for man to explore space. They were (1) international prestige, (2) possible military advantage, (3) the spirit of adventure, (4) the possibility of practical technical advances, and (5) the thirst for knowledge—the desire to learn more about the cosmos.

He agreed that the new organization should absorb the present National Advisory Committee for Aeronautics, and the new agency should have expanded authority and liberalized policies for the support of research by outside agencies. He said:

> Certainly scores of excellent research laboratories in universities, research institutes, and some industries should be supported by contracts in contributing research knowledge to the multiheaded problems of space.
>
> If this aspect is not adequately handled, the national program will be greatly weakened. There is always the tendency, even if not the intent, for large Government organizations to become monopolistic. This tends to freeze out great blocks of talent, new ideas, and appropriate competition. Further, it seriously shrinks the reservoir of manpower from which future research talent can be drawn. I trust that adequate attention will be given to this important matter.

(10) *Dr. Alan T. Waterman*, director, National Science Foundation (pp. 973–1022), gave his views on the need for accelerating our progress in space research, technology, and exploration. He said:

> At the outset let me state that I heartily endorse the general outline of H.R. 11881, H.R. 11882, and S. 3609, which I believe are before you.
>
> The establishment of a new civilian agency appears to me to be the best method for carrying out the objectives desired.

This is particularly true since the new agency could retain the successful experience and excellent relationships of NACA.

In addition, in my opinion, the importance of this subject is such as to justify its assignment to a particular agency with the specific purpose assigned to it here.

In this way the hard-won lessons of the past will assist us to make the most rapid possible progress in developing the means for exploration and of actual flight in outer space.

Furthermore, the vast new horizons that will be opened up by progress in this area of scientific activity are of concern to very many segments of the national community; they include, but stretch far beyond purely military considerations.

Finally, a civilian-led program would place this country in a position to cooperate with other nations with respect to conquering the problems of space exploration, and would better assure a cooperative world reaction than would an effort conducted by the military.

The impetus for a determined effort in the direction of space exploration was, as you know, provided by the International Geophysical Year.

(11) *Frederick C. Durant III*, former president, American Rocket Society, and International Astronautical Federation (pp. 1028–1079), suggested that the following programs be established in conjunction with any national space agency:

1. A program to collect and disseminate information regarding plans and progress of the U.S. space flight program, as well as those of other countries.

2. The establishment of a significant number of graduate level scientific research scholarships with credit for advanced academic degrees.

Such scholarships should be on a funded basis, based upon international competition as well as, perhaps, on an exchange basis.

3. A continuing program of international competition with regard to experimental research to be conducted in U.S. satellites.

4. I propose that the United States take the initiative and, through the United Nations, call for an "International Conference on the Peaceful Applications of Rocket Power."

Finally the United States has the opportunity to become a leader in astronautics and to share with other nations our plans and programs for space research. The return benefits which could accrue to the United States would be positive and widespread; not only from a scientific and technical standpoint, but from the respect and enthusiasm we will elicit for sharing with others our astronautical heritage.

c. Action taken

A new bill, H.R. 12575, was reported out of the House Select Committee on Astronautics and Space Exploration on May 24, 1958 (H. Rept. 1770). (1) It declared the policy of the United States that

outer space be devoted to peaceful purposes, and that the exploration of space be so conducted as to promote world peace. (2) While keeping control in a straight-line civilian organization formed around the NACA as a nucleus, with authority and responsibility vested in a single Administrator assisted by an Advisory Committee, the bill sought to assure maximum cooperation and exchange of scientific and technical ideas and information between civilian and military organizations by providing for (a) such cooperation on all matters involving both peaceful applications and military requirements; and (b) freedom for the military department to conduct such basic and applied research and development as may be necessary and appropriate to their military missions.

To accomplish these purposes, the civilian agency was directed, and not merely authorized, to cooperate with the Department of Defense—and also with the Atomic Energy Commission and other departments and agencies concerned. In describing the field of cooperation, the committee kept the language of the previous bill—"peculiar to or primarily associated with weapons systems or military operations"—but broadened it by adding: "or the defense of the United States (including the research and development necessary for the defense of the United States)."

Other important changes are summarized in the committee report as follows (pp. 7–8):

> (3) As to matters of organization, the bill provides not only for an Administrator but for a Deputy Administrator (both appointed by and with the advice and consent of the Senate) and for a General Counsel. It further provides for divisions on military and nuclear application respectively, and for such other divisions as the Administrator finds necessary.
>
> (4) The bill establishes a Military Liaison Committee, similar to that of the Atomic Energy Commission, and also an Atomic Energy Liaison Committee. The Chairmen of these Committees would be appointed by the President. Other members would be assigned by the Secretary of Defense and the Atomic Energy Commission respectively.
>
> In effect, the Military Liaison Committee provides the machinery for carrying out the policy of civilian control and civilian-military cooperation.
>
> (5) The composition of the 17-member Advisory Committee has been changed. The bill provides that 9 members, rather than a maximum of 8, shall be appointed from appropriate departments and agencies of the Federal Government, and that a minimum of 3, rather than 1, shall be from the Department of Defense. In making this change, also recommended by the administration at a late stage, your committee's thought was that the Advisory Committee would perform liaison and coordinating, as well as advisory, functions within the Federal Government. Four-year terms are stipulated for the members, except that the President may make initial appointments for shorter terms.
>
> In the previous bill (which designated the head of the Agency as the Director), the Director was required to consult the Board (as it was then designated), though not to take

its advice, prior to certain specified actions. This requirement was thought to be too restrictive. Accordingly, consultation with the Advisory Committee is still required on the same matters, but not as a condition to taking executive action.

Since the agency itself is to make a semiannual report to the President for transmittal to the Congress, the provision for a separate report by the Advisory Committee was eliminated.

The previous bill provided that—

> the Board may make recommendations to the President with respect to the appointment of the Director, and the Director shall not be appointed until the Board shall have had a reasonable opportunity to make such recommendations (sec. 5 (b)).

This limitation on the President's power of appointment seemed open to question. The entire provision was eliminated as unnecessary and probably ineffective.

The administration has concurred in the changes described above, concerning the Advisory Committee.

(6) The functions of the space agency have been enlarged and clarified.

In the previous bill, the agency was directed to "develop a comprehensive program of research in the aeronautical and space sciences." There was doubt whether these words would be broad enough to permit the accomplishment of the purposes set forth in other parts of the bill. In particular, they seem narrower than the "problems of flight within and outside the earth's atmosphere." The testimony of committee witnesses indicates that research conducted by the agency should include other matters, such as the legal aspects of outer space, and the exploration of space, in addition to the aeronautical and space sciences as strictly defined. Hence, the present bill speaks of a comprehensive program of research and development in the aeronautical and space sciences and related matters.

In another direction, the functions of the agency have been curtailed. The previous bill directed the agency to "develop, test, launch, and operate aeronautical and space vehicles." This provision has been subordinated to the general function of research, so as to bring it into harmony with other provisions of the bill and to avoid any implication that the commercial operation of aircraft or space vehicles is to be an independent function of the agency.

(7) Title IV of the bill establishes a Joint Committee on Aeronautics and Outer Space.

Such a committee would provide a number of advantages. In addition to preventing possible conflicts and omissions, as well as unnecessary duplication, it would give Congress the means to oversee executive operations effectively in the highly important and urgent field of space flight.

The successful example of the Joint Committee on Atomic Energy has been closely followed. Thus, for example, the Joint Committee on Aeronautics and Outer Space would be composed of nine members from each House, no more than five of whom could be members of the same political party. The chairmanship would alternate with each Congress between the two Houses.

(8) The bill provides in general that information obtained or developed by the Administrator shall be made available for public inspection. This provision affirms the intent of Congress to let the people know all the facts, and to promote the spread of scientific knowledge, subject only to necessary security restrictions. Exceptions are made for information which is authorized or required by Federal statute to be withheld or is classified to protect the national security. The bill further provides that nothing in the act shall prohibit the furnishing of information by the Administrator to the Senate or the House of Representatives or to any committee of Congress.

(9) The bill authorizes the agency to engage in a program of international cooperation in carrying out its functions and in the peaceful exploration and use of outer space. Although not in the previous bill, except as a declaration of policy, a provision to this effect was later proposed by the President.

Your committee points out that section 302(a)(6), line 3 of page 19 permits the Administrator to cooperate with other public and private agencies. It was the committee's intent to authorize such cooperation with foreign and overseas organizations or individuals when deemed appropriate. The experience of the International Geophysical Year is illustrative of the benefits such authority might promote.

A new section (507) provided for patent rights, as follows:

Subsection (a) provides that any invention or discovery made or conceived under any contractual or other relationship with the new agency shall belong to that agency, unless the Administrator waives the agency's claim to such invention or discovery.

Subsection (b) provides that where the Administrator waives the agency's claim to an invention or discovery made or conceived under such a relationship, he shall retain the right to use the invention or discovery in carrying out his functions and to license it to others for use in carrying out the activities authorized by the act; and in any such case he may pay or require any licensee to pay the inventor or discoverer a reasonable royalty for the use of the invention or discovery.

Subsection (c) authorizes the Administrator, in any case where the new agency's claim is not waived under subsection (a) and the invention or discovery accordingly becomes its property, to pay the inventor or discoverer a cash award as compensation for the invention or discovery.

d. Debates in House

H.R. 12575 was discussed in the House, with almost no opposition expressed. Representatives McCormack, Arends, Brooks of Louisiana, O'Brien of New York, Metcalf, Natcher, Sisk, Ford, Haskell, Hays of Arkansas, and Holifield, all urged passage of the bill. On June 2, 1958, H.R. 12575 unanimously passed the House.

C. BILLS INTRODUCED AND CONSIDERED—SENATE

1. S. 3609, APRIL 14, 1958 (MESSRS. JOHNSON OF TEXAS AND BRIDGES)—85TH CONGRESS

a. Provisions

This bill was identical with H.R. 11881.

b. Hearings and significant testimony

Hearings were held before the Special Senate Committee on Space and Astronautics, May 6 through 15, 1958. In general, the problems discussed in the House hearings presented themselves in the Senate hearings.

(1) *Senator Lyndon Johnson*, chairman (pp. 1–8), presented the opening statement and outlined the main questions to be answered in the course of the hearings. He said:

> What is before us now is not a question of whether we should begin the orderly exploration of space but, rather, the question of how such exploration may best be directed and initiated. We are past the point of studying sketches. It is time to get the blueprints drawn and start pouring concrete for the foundation.
>
> There is an obvious need within our Government for a structure and organization to give purpose, direction, and impetus to the national effort. That is what this committee is here to consider and to recommend.
>
> We cannot expect and do not expect to resolve this question for all time to come. Knowing as little as even our best minds know about space, it would be the height of vanity for us to suppose that we could—in an age not yet 12 months old—settle national policy for decades or centuries ahead.
>
> On the contrary, our particular challenge—as I see it— is to devise a pattern which encourages rather than inhibits the full response of American initiative to the infinite challenges of outer space.
>
> If we create the agency which the challenge requires, it will be unlike rather than like anything now existing in the Federal Government. Certainly, it will require the closest attention from the Congress in the years immediately ahead to make certain that this potential is fully realized. For that reason, we must also make provision for Congress to give permanent attention to this new enterprise.
>
> Space, as I said, is a new dimension. Hence, it in no way detracts from or usurps the role of existing agencies or the

programs of committees but, rather, it adds to and greatly expands the role of each. In fact, if our blueprints are proper and our building adequate, we should assure that after this period of transition there will be a diminished need for special agencies and special committees to deal with space.

Space affects all of us and all that we do, in our private lives, in our business, in our education, and in our Government. We shall succeed or fail in relation to our national success at incorporating the exploration and utilization of space into all aspects of our society and the enrichment of all phases of our life on this earth.

(2) *Wilber M. Brucker*, Secretary of the Army (pp. 215–236), told of the immensity of the task involved in forging ahead and maintaining indefinitely a commanding lead in the scientific and technological progress leading to development of outer space. His views on the legislation were summarized as follows:

I concur in the concept that the National Aeronautics and Space Agency should be a civilian agency with Department of Defense representation. Such military representation is particularly important to the overall success of NASA since within the Department of Defense programs are to be found most of the talent, and most of the physical assets which are necessary to the immediate programs which would be carried on by the NASA. The NASA, therefore, will have major dependence upon the Department of Defense for a long time to come.

As set up under S. 3609, the Advisory National Aeronautics and Space Board would consist of not to exceed 17 members, at least 1 to represent the military interest, and the rest concerned with the civilian interest. It seems clear to me that whatever the composition of the Advisory Board may be, fully adequate military liaison will be established and maintained with the working group of the Agency to the end that military requirements are given adequate consideration.

I believe the Department of Defense should be assured the same working relationship with the proposed NASA as with the National Advisory Committee on Aeronautics. I see no major problems in establishing effective cooperation between the National Aeronautics and Space Agency and the Department of Defense, particularly since Department of Defense responsibility is now centered in the Advanced Research Projects Agency. However, it is possible that the bill now under consideration could be interpreted so as to restrict unduly the activities of the Department of Defense in the astronautics and space field. It is frequently difficult to determine as we embark on so vast and unknown an enterprise as space exploration just what facets of this exploration will have application to weapons systems and military operation. I do not believe it to be the intent of the administration or of the Congress to prohibit research in this area by the agencies of the Department of Defense.

The legislative line should not be drawn too sharply between what the Department of Defense and its agencies can

do and what they cannot do in the field of space development. This is a matter which ought, in my opinion, to be dealt with administratively between the Department of Defense and the NASA. It should also be clearly emphasized that the NASA, like the Atomic Energy Commission, is a part of the executive branch. It is imperative that the character of the National Advisory Committee for Aeronautics, an executive agency of which the NASA will be the successor, should be preserved. If the United States is to cope with the fast-changing conditions, and kaleidoscopic developments in the field of space, full discretion in the planning and operations of such an important agency should be left to the President.

The recent attainment of stable orbited satellites by man in the space close to our planet has had a profound impact upon the urgency to develop a forceful and energetic program in the conquest of space. The need to forge ahead in this new environment is manifest not only in military applications but more importantly in those areas which benefit man and the world community. The required legislation must facilitate the growth of the total coordinated effort to meet the needs of peaceful developments without placing in jeopardy the enhancement of military capabilities.

In a direct sense, space development and exploration is linked to a broader national problem. The strength and depth of the Soviet technological challenge is part of a larger scheme of world domination by the Communists. To add emphasis to the world threat recent Soviet moves are contemporaneous with the birth of the missile-nuclear-space age in which they have already demonstrated technological skill and psychological dexterity.

Accordingly, our American response must be productive in supplying the means by which we can apply our genius and resourcefulness to the task of conquering space effectively and with dispatch. Our space program must be broad in scope, and must utilize every capability in order to make the best possible use of our combined national potential in this new field.

I have reviewed the proposed legislation and recommend its adoption.

(3) *W. H. Pickering*, director, Jet Propulsion Laboratory, California Institute of Technology (pp. 344–355), summed up his views on the necessity of the space agency, as follows:

One can first of all ask, Do we need a new space agency or can the space job be done with the existing scientific and military groups in the country? And my feeling here is that a new agency is needed because of the magnitude of this program.

The costs of this program are going to [be] very large. There is no getting away from that; large in dollars. Looked at from the point of view of national effort, one might say perhaps a quarter of a percent of the national income might be diverted to the space programs.

With a large expenditure and with a necessity for long-term planning, it appears to me that there must be a well-integrated national program, and this means, then, that a single agency should integrate and control the program rather than to have it on a catch-as-catch-can basis as some of our research activities have been up to now, and quite rightly so, because there is much research which obviously should be supported by different agencies. But when we are talking about a project of this magnitude, then I feel a single agency, a single space agency, a civilian space agency, is required. It is necessary that this agency have the imagination and the boldness to establish a program which is ambitious but not rash. It is necessary also that this agency have the continuing funds necessary to carry out such a program.

The magnitude of the efforts becomes comparable to the AEC type effort, but I feel that this is a different sort of activity than the AEC in that rather than growing out of—rather than having a program which grows out of a military requirement, as the AEC program has grown and broadened from its initial military objectives, here we have a program which I feel should start on the other side. It has more similarity to the IGY Antarctic program where the effort is initially scientific and there may be military byproducts which will develop later on, but the organization which carries out the program, rather than being an AEC-type operation with strong military overtones should start in the other direction as a scientific operation which will develop military by-products.

The present bill which proposes a new national space agency would appear to me to meet the objectives as I see it. I do feel that there is one comment I would like to make, however, and that is the association of the National Space Agency with the National Advisory Committee for Aeronautics. I feel that the new Agency has to do a job which is quite different from the job which is now being carried out by the NACA, and in this light, then, I regard the new Agency as in fact a new Agency which incidentally absorbs the NACA rather than an agency which grows out of the NACA. I believe that the wording of the bill is such as to imply this, but I merely wanted to emphasize that from my point of view I feel that this is important, that the new Agency have the authority and have the tasks assigned to it which are in the bill and which are a different set of tasks than those assigned to the NACA.

(4) *Dr. James Van Allen*, chairman, Rocket and Satellite Research Panel, and professor of physics, University of Iowa (pp. 355–359), listed the following purposes of a national space program run by a civilian agency:

> In the first place, there is a vast amount of ignorance, just simple ignorance, about what is going on in the upper atmosphere of the earth and in the space surrounding the earth. So I feel that the first, and the most basic undertaking of the civil agency is the investigation of the phenomena of nature on a geophysical and astrophysical scale.

Second, there has been a great deal said about the aspect of human adventure and exploration. I have no special advocacy of "the man in space" undertaking. I feel that it is something which men will wish to do and in due time will do. I think the incentives are of the same nature that Magellan must have had in starting around the world, namely, just to see what is around the world; and I do believe that, in the long term, human exploration of space will possibly be a sigficant field of human activity.

Thirdly, there is the application of new knowledge and techniques resulting from these investigations to the promotion of the intellectual agricultural and industrial capabilities of the Nation.

Fourth, there is the aspect of the advancement of international understanding by cooperation in undertakings which are naturally and necessarily of worldwide scope. The International Geophysical Year is certainly the most tangible and most well known example of such an undertaking.

And finally, there is the application of all the knowledge and techniques resulting from the above investigations to the development of military weapons systems and to the more effective conduct of offensive and defensive warfare.

In order that we may have as a nation an effective space program, there are two simple things required:

In the first place, we require enabling legislation which establishes an astronautical agency as a major Federal activity.

In the second place, we must have adequate funding on a long-term basis for the execution of this undertaking.

Many of us have been concerned with these questions for some time; and, as you probably know, various groups of us have developed informal proposals of this nature for several years.

Most of us believe that we will require something like $500 million a year for the civil space undertaking. I think one should have such a figure in mind when he is thinking of a vigorous national program.

c. Action taken

S. 3609 was amended and reported out of the Senate Special Committee on Space and Astronautics (S. Rept. 1701). A section on patents was included in the amended bill similar to the one added by the House.

d. Debates in Senate

S. 3609 was debated in the Senate on June 16, 1958. It contained a patent provision similar to the House bill, but this was deleted so that the whole subject could be discussed at the conference, and the conferees could attempt to evolve a section which would be satisfactory to both sides.

Senators Johnson of Texas. Bridges, Carroll, and Saltonstall were among those advocating passage of the bill. Mr. Saltonstall pointed

out the major points on which there was room for differences of opinion:

> The first was whether there should be a Policy Board and an operating agency headed by a single civilian or just the one-man agency We decided on having a Policy Board, with the operating agency under the Policy Board—with the Board located in the Office of the President of the United States.
>
> Another question was whether there should be a joint committee of Congress, or two separate committees, one in the House and one in the Senate, having jurisdiction over the field, covered by the bill. The House bill provided for separate committees. The Senate committee bill has provided for a joint committee. That question can be ironed out in conference.
>
> The third subject was the question of special pay. That question has been worked out briefly in the Senate bill by permitting enough authority for supergrades for the space agency to commence operations, and then getting a recommendation from the Civil Service Commission on pay scales.
>
> The fourth question concerned the transfer authority. There is no provision for transfer authority in the Senate bill. Broad transfer authority was provided in the House bill. It was felt that the subject could be worked out in conference.
>
> The Senate has deleted the patent rights provision from the bill. That matter can also be worked out in conference as is true of the transfer authority provision.
>
> Lastly, there was the question of the jurisdiction of the Department of Defense on purely defense matters. That provision was amended by the full committee in the draft of the bill, and has been discussed by the eminent Senator from Texas and the eminent Senator from New Hampshire. I shall not elaborate on it.

H.R. 12575, as amended by the Senate, was passed in lieu of S. 3609 on June 16, 1958.

D. CONFERENCE REPORT AND PUBLIC LAW 568

A conference was held on July 15, 1958 (H. Rept. 2166), and the differences reconciled and some of the original provisions rewritten. This bill was agreed to by the House and the Senate on July 16, 1958, and signed into law on July 29, 1958.

Some major points of the substitute bill, and some of the differences between it and the House and Senate versions, are as follows:

Section 102, dealing with policy and purpose, declared in subsection (a) that it is to be the policy of the United States that activities in space should be devoted to peaceful purposes.

Subsection (b) delineated in the field of aeronautical and space activities the responsibility which will be exercised by the new civilian space agency and that which will be exercised by the Department of Defense. The House and Senate language differed considerably in approach but not in intent, and both provisions suffered from what the

committee considered were risks of misinterpretation. In order to avoid overlapping, it was necessary that machinery be provided at the highest level of Government to make determinations of responsibility and jurisdiction. The rewritten bill made such provision by providing that the President, assisted by an Advisory Council, should make the actual determinations in the assignment of new programs or projects. The act also provided that the Administrator of NASA and the Secretary of Defense could seek solutions to questions of jurisdiction either directly or through a Civilian-Military Liaison Committee to hold to a minimum the questions referred to the President and the Council.

The conference committee described the determinations as follows:

> The determinations may establish some projects as exclusively military, and some as exclusively civilian, but still provide for full exchange of such information as the other agency may require to carry out its responsibilities. Some projects may be determined to be of sufficient joint interest to be conducted cooperatively. Other determinations may be required to establish whether certain projects are aeronautics and space activities as defined under the act, in order to know whether they must be assigned either to the Administration or the Department of Defense, or belong to other Government agencies.
>
> The intention is that mixed projects which have only a partial aeronautics and space aspect shall also be conducted cooperatively among the agencies concerned, with the aeronautics and space activity aspect assigned to the jurisdiction of the Administration or the Department of Defense. In effect, the principle to guide the assignment of projects is provided by the declaration of policy contained in this section, but machinery for establishing facts and for weighing the national interest is provided by the substantive provisions of the act. This means that neither the Administrator nor the Secretary of Defense can choose his own area of aeronautical and space activity to the exclusion of the other agency without there being a higher consideration as to the correctness of his decision. Indeed the program-assigning function of the President would minimize the chance that differences will arise in the original instance.

Section 201 dealt with the establishment of the National Aeronautics and Space Council. The House bill provided for an Advisory Committee composed of private and governmental members. The Senate amendment provided for a Policy Board, composed of governmental members only, which would allocate responsibility for major aeronautical and space projects within the U.S. Government. The conference committee, in lieu of both the House and Senate provisions, established a National Aeronautics and Space Council.

In section 202, the House bill established a National Aeronautics and Space Administration, headed by an Administrator. The Senate amendment provided for a National Aeronautics and Space Agency, headed by a Director. The conferees adopted the House language.

Section 204 dealt with the establishment of the Civilian-Military Liaison Committee. The House bill established a Military Liaison

Committee headed by a Chairman appointed by the President and composed of military representatives. Its members, through daily contact with Administration personnel ,would have coordinated aeronautical and space activities of the military departments and the new agency and resolved differences arising from a determination of jurisdiction.

The Senate amendment did not provide for a Military Liaison Committee. The conference substitute provided for a Liaison Committee composed of representatives, in equal number, of both the military departments and the Administration. In the event of a failure of the Liaison Committee to reach an agreement, the decision of the President would be final.

The conferees did not include the section providing for an Atomic Liaison Committee, feeling that the Administrator would cooperate with the Atomic Energy Commission under general authority contained in the act empowering him to do so.

Both the House bill and the Senate amendment contained similar provisions authorizing the new agency to engage in a program of international cooperation, included in section 205. Under the House bill, such program would have been carried on under the foreign policy guidance of the Department of State and pursuant to agreements negotiated or approved by the State Department. The Senate amendment provided for "agreements made by the President with the advice and consent of the Senate." The conferees adopted a revised version of the Senate provision, specifying that the Administration would act under the foreign policy guidance of the President rather than the State Department.

Section 304 dealt with the often discussed problem of security. The House bill contained a provision requiring the Administrator to "establish such security requirements, restrictions, and safeguards as he deems necessary in the interest of the national security." The Senate amendment did not contain this provision, but left the matter, to be covered by existing law. The conferees adopted the House provision. Both measures contained provisions authorizing the Atomic Energy Commission to give Administration personnel access to restricted data. The conference adopted a substitute broadening this provision to give individuals granted access to such data the authority to exchange such data with similarly cleared military personnel.

By way of explanation of the patent provisions in section 305, the conference report concluded:

> Operating on the theory that the Government's interests must be protected, but with the concomitant purpose of protecting private interests and of keeping private incentive and initiative at a high level, the committee of conference adopted entirely new patent provisions.

Section 306 on the contributions awards was also added in conference.

Public Law 568 was called the National Aeronautics and Space Act of 1958. Its main provisions are as follows: It was declared to be the policy of the United States that activities in space should be devoted to peaceful purposes; that the general welfare and security of the United States require adequate provision for aeronautical

and space activities; that such activities, except those of a military nature, shall be directed by a civilian agency; and that such activities shall be conducted so as to contribute to one or more of the following objectives: (1) the expansion of human knowledge of phenomena in the atmosphere and space; (2) the improvement of aeronautical and space vehicles; (3) the development of vehicles capable of carrying living organisms and equipment through space; (4) the establishment of long-range studies of the benefits, opportunities, and problems involved in space activities; (5) the preservation of the United States as a leader in aeronautics and space science; (6) the dissemination to agencies concerned with national defense of discoveries having military value; (7) the cooperation with other nations in space activities and the peaceful application of the result; and (8) the effective utilization of the scientific and engineering resources of the United States to avoid duplication of effort.

It established the National Aeronautics and Space Council composed of the President, the Secretary of State, the Secretary of Defense, the Administrator of the National Aeronautics and Space Administration, the Chairman of the Atomic Energy Commission, not more than one other member from a Federal agency, and not more than three members from private life.

It set forth the function of the Council as adviser to the President with respect to the performance of the following duties: (1) to survey aeronautical and space activities; (2) to develop a comprehensive program of aeronautical and space activities by Federal agencies; (3) to fix responsibility for the direction of major aeronautical and space activities; (4) to provide for effective cooperation between the National Aeronautics and Space Administration and the Department of Defense; and (5) to resolve differences arising among Federal departments or agencies with respect to aeronautical and space activities.

It established the National Aeronautics and Space Administration headed by an Administrator appointed by the President with the advice and consent of the Senate, and set forth the functions of the Administration to (1) plan, direct, and conduct aeronautical and space activities; (2) arrange for participation by the scientific community in planning scientific measurements and observations; and (3) provide for the widest practical dissemination of information concerning its activities and the results thereof. It conferred authority on the Administration for the performance of the above functions.

It provided for a Civilian-Military Liaison Committee consisting of a chairman appointed by the President with the advice and consent of the Senate, one or more representatives from each of the military departments, and one or more representatives from the Administration.

It directed the Administration and the Department of Defense to advise and consult with each other through the Committee on all matters within their respective jurisdictions relating to aeronautics and space activities.

It authorized the Administration to engage in programs of international cooperation pursuant to agreements made by the President with the advice and consent of the Senate.

It provided for the transfer of the functions, powers, duties, property, and personnel of the National Advisory Committee for Aeronautics to the Administration, and authorized the President during the next 4-year period to transfer to the Administration any function of any other department or agency which relates primarily to the functions, powers, and duties of the Administration.

Section 305 relating to patent rights (the full text of which appears in appendix B, infra) provided in substance as follows: (a) An invention made under Administration contract shall belong to the Administration (1) in the case of research employment, where it relates to such research, is within the inventor's duties, or involves Government facilities, time, etc., and (2) in the case of nonresearch employment, where it relates to the inventor's duties and involves Government facilities, time, etc. (b) Administration contracts shall require contractors to report any inventions made in the performance thereof. (c) No patent may issue (except to the Administrator) on inventions useful in conducting aeronautical and space activities unless the applicant files a statement with the Commissioner of Patents of the circumstances of the invention and the relation, if any, to work under Administration contract. (d) Any patent on an invention referred to in subsection (c) shall issue to the Administrator on his request unless the Board of Patent Interference, to which the applicant may refer the matter, concludes that the latter is entitled to it. (e) Any patent issued to applicant under subsection (d) as a result of misrepresentation by him may be assigned to the Administrator upon proceedings, as prescribed, brought in the Patent Office. (f) The Administrator may waive rights in any invention upon determination that "the interests of the United States will be served thereby," but subject to a free nonexclusive license for the United States (and foreign countries pursuant to treaty); proposals for such waiver to be made to an Inventions and Contributions Board which, after hearings, shall make recommendations to the Administrator with respect thereto. (g) The Administration shall set the terms and conditions for licensing patents held by it. (h) It shall take suitable action to protect inventions it owns and require others to protect those under which it is licensed. (i) The Administration is classified as a defense agency for purposes of chapter 17 of title 35. (j) Definitions.

Section 306 relating to "contributions awards" (the full text of which appears in appendix B, infra) provides as follows: (a) The Administration may make monetary awards to persons making scientific or technical contributions of significant value in aeronautical and space activities; the Inventions and Contributions Board, after hearings, shall make recommendations to the Administration; factors to be considered are: (1) value of the contribution, (2) development expenses of the applicant, (3) compensation previously received, and (4) other factors. (b) If there is more than one applicant for the same contribution, the Administration shall make or apportion the award in such manner as it deems equitable; the conditions of the award are (1) that applicant surrender all claims against the United States (or foreign countries pursuant to treaty) and (2) a $100,000 maximum, except that a larger award may be made if submitted to Congress and the latter does not object within 30 days.

IX. SMALL BUSINESS AND RESEARCH AND DEVELOPMENT

A. BACKGROUND

For many years, Congress has been concerned with the preservation of free competitive small business enterprise in the United States, and this concern culminated in the establishment of the Small Business Administration in 1953. In the past few years increasing attention has been directed toward the extent to which small enterprises are able to, and do, participate in Government procurement contracts with the Federal Government. Specific interest has been expressed as to this participation in research and development contracts of the Government.

President Eisenhower established on May 31, 1956, a Cabinet Committee on Small Business, giving the Committee the continuing assignment of "making specific recommendations * * * for administrative actions, and, where necessary, for additional legislation to strengthen the economic position of small businesses and to foster their sound development." [110] One of the findings of this Committee, as expressed in its progress report to the President on May 31, 1956, was:

> * * * the pace of technological change has been accelerating in recent years. Large and well-financed firms have been accustomed to undertaking costly research and development programs which enable them to set the pace or meet the pace of industrial innovation and investment. Small business enterprises cannot normally do this.

Subsequent reports by the Cabinet Committee on Small Business contained recommendations which were acted upon by the President. Two of the recommendations in the progress report dated August 7, 1956, were:

> (5) That the President arrange for a comprehensive review of Federal agency procurement legislation, policies, and procedures with a view to extending small business participation in Government contracts.
>
> (10) That the President call a conference on technical research, development, and distribution for the benefit of small business.

On November 9, 1956, the Attorney General issued a report pursuant to section 708(e) of the Defense Production Act of 1950, in which he was critical of economic trends associated with research and development in the United States, warning that the total effect of Federal research and development might tend to increase the concentration of economic power. He suggested several measures to be taken for an examination of the problem of the distribution of federally financed research and development among the various size classifications of industry, and concluded:

> It is accordingly recommended that consideration be given to, first, the possibility of removing certain practical obstacles to the participation of smaller businesses in the research and

[110] Letter from the President to Arthur F. Burns, Chairman, Council of Economic Advisers, made public by the White House, May 31, 1956.

development effort, and, second, if further study bears out our tentative conclusions, a reevaluation of the basic patent policy of the Department of Defense, in the light of current defense problems and the increased participation of Government in research activity, to determine whether Government acquisition of resulting inventions and patents would be more in the public interest.

B. BILLS AND RESOLUTIONS CONCERNED WITH RESEARCH AND DEVELOPMENT—85TH CONGRESS

1. BILLS AND RESOLUTIONS INTRODUCED

a. House Resolution 166, February 14, 1957 (Mr. Thompson of New Jersey)

This resolution would authorize and direct the House Committee on Small Business to conduct a full and complete investigation and study of (1) the amount and proportion of funds distributed by Federal departments and agencies for research and development facilities and work to the various segments of industry and the various sizes and classes of firms; (2) the methods, standards, and criteria being used by the Federal departments and agencies for distributing such Federal funds among various competing firms and sizes and classes of firms; (3) the methods and procedures adopted by the Federal departments and agencies to safeguard the interest of small business in research and development work and to assure broad participation by such firms in federally sponsored and federally aided research and development programs, and the extent of the success of such methods and procedures; (4) the extent to which the award of Federal research and development contracts determines the distribution of Federal contracts for procurement of supplies and services; (5) the extent to which the granting of Federal funds for research and development work influences or determines the employment by small business of scientifically and technically trained research personnel; and (6) the procedures and methods in use by Federal departments and agencies concerning the assignment of patents and the licensing of patented inventions made or developed with the assistance or use of Federal funds.

b. H.R. 6645, April 4, 1957 (Mr. Hill)

This bill would rewrite the Small Business Act of 1953 making certain technical and clarifying changes and converting the Small Business Administration into a permanent agency of the Government. Section 209(d), read as follows:

> For the purposes of aiding in carrying out the national policy to insure that a fair proportion of the total purchases and contracts for supplies and services for the Government be placed with small-business enterprises, and to maintain and strengthen the overall economy of the Nation, the Department of Defense shall make a monthly report to the President, the President of the Senate, and the Speaker of the House of Representatives not less than forty-five days after the close of the month, showing the amount of funds appro-

> priated to the Department of Defense which have been expended, obligated, or contracted to be spent with small-business concerns and the amount of such funds expended, obligated, or contracted to be spent with firms other than small business in the same fields of operation; and such monthly reports shall show separately the funds expended, obligated, or contracted to be spent for basic and applied scientific research and development.

c. H.R. 7474, May 13, 1957 (Mr. Multer)

H.R. 7474 provided that the Small Business Administration shall be a permanent agency, clarified the definition of "small business," contained extensive and detailed provisions for loans to and financing of small business, etc. Section 107(k) provided that it shall be the duty of the Administration * * *

> to make studies and recommendations to the appropriate Federal agencies to insure that a fair proportion of the total purchases and contracts for supplies and services for the Government be placed with small-business enterprises, to insure that a fair proportion of Government contracts for research and development be placed with small-business concerns, and to insure a fair and equitable share of materials, supplies, and equipment to small-business concerns.

d. Senate Resolution 138, May 20, 1957 (Mr. Sparkman and others)

Senate Resolution 138 provided that it is the sense of the Senate that the present percentage of small business contract awards by the Department of Defense is inadequate and there should be established a reasonable percentage standard for the more precise guidance of Government purchasing agencies.

e. H.R. 7963, June 6, 1957 (Mr. Spence, reporting from committee)

This bill would rewrite the Small Business Act, making various changes in the interest of promoting a more vigorous and efficient program of assistance to small business. The principal changes are (1) to make the Small Business Administration a permanent agency, (2) to improve the facilities for loans to small business through larger authorizations, lower interest rates, etc., and (3) to provide for a more equitable share of Government procurement for small business by requiring a new definition of small business for procurement purposes. Section 9 provided for the encouragement of research and development in small business by the awarding of Government contracts. As reported from the House committee, this section was identical to section 209(d) of H.R. 6645, supra p. —.

f. S. 2993, January 13, 1958 (Mr. Fulbright)

This bill would direct the Small Business Administration to assist small business concerns in obtaining Government contracts for research and development and in benefiting from research resulting from Government support. It would permit the Administrator, with the

approval of the Attorney General, to approve agreements between small business firms for joint programs of research and development, if the Administrator finds that the joint program proposed will maintain and strengthen the free enterprise system and the economy of the Nation.

g. S. 4033, June 19, 1958 (Mr. Javits)

Small Business Research and Development Assistance Act of 1958 authorized the Small Business Administrator, with the approval of the Attorney General, to approve any agreement between small business firms providing for a joint program of research and development, if the Administrator finds that the joint program proposed is consistent with the competitive, free enterprise system and will strengthen the national economy. Authorized the Administrator to make loans to any research and development organization established pursuant to an approved agreement, in order to provide such organization with funds needed for sound financing, growth, and experience, such loans to have a maturity not exceeding 30 years. Increased the revolving fund to a total of $550 million (now $530 million). Provided that loans to research and development organizations shall not exceed an aggregate of $20 million outstanding at any one time.

2. HEARINGS AND ACTION TAKEN

a. Hearings, House of Representatives

Hearings on H.R. 6645 and H.R. 7474 were held by the House Committee on Banking and Currency, May 14, 15, 16, 21, and 22, 1957. The only testimony of significance relating to the encouragement and support of research and development and assistance to small business in that area, was by *Wendell B. Barnes*, administrator of the Small Business Administration (pp. 18–113), who reported as follows on the contracts awarded in fiscal year 1956:

> The Department of Defense has reported that small business concerns were awarded 5.9 percent of its research and development prime contracts during fiscal year 1956. Small firms were awarded 9.7 percent of total Army contracts, 9.4 percent of Navy contracts, and 3.7 percent of Air Force contracts. However, since awards to educational and nonprofit institutions are included in these small business percentages, they do not adequately reflect the volume of research and development contracts going to small firms.
>
> In their procurement counseling, Small Business Administration staff members stress to qualified small business concerns the importance of their trying for research and development work and guide them to the proper offices. This is important, because a firm which performs a research and development contract has an advantage over competitors when the production contract for the item is awarded.
>
> During the last half of calendar year 1956, one-fourth of the value of all procurements screened by the agency's representatives at the Quartermaster Research and Development Command, Natick, Mass., was jointly set aside for

small business. Good progress also is being made in other Army and Navy installations.

Other witnesses testified as to the importance of granting Government contracts to small business, but there was little discussion of the research and development aspect.

b. Action taken, House of Representatives—H.R. 7963

After the hearings, a clean bill (H.R. 7963) was introduced and reported favorably (H. Rept. No. 555), June 13, 1957. Its provisions are discussed supra, page 138.

H.R. 7963 was debated in the House on June 25, 1957 (Congressional Record, pp. 10205–10245), and passed by a large majority (p. 10245). Mr. Thompson of New Jersey (p. 10225) expressed the hope that H.R. 7963 would really take care of granting a fair proportion of all types of Government contracts to small business, and would not continue to be "just a pious hope and expression."

c. Hearings, Senate

The Senate Committee on Banking and Currency held hearings on the credit needs of small business. Part 1 of these hearings were held during the 1st session of the 85th Congress and did not deal, to any great extent, with the problem of encouraging research and development by small business. Part 2, however, held May 23, 1958, included considerable testimony on this aspect as a device for aiding small enterprises to remain in business. Senator Fulbright's bill, S. 2993, was discussed in this connection.

(1) *Senator Fulbright* (pp. 558–559) asked that his statement explaining S. 2993 be printed in the hearings. It reads as follows:

> The growth and progress of industry and commerce in the United States has been, to a very considerable extent, the result of research and development. Research in the fields of electronics, chemistry, physics and other sciences has yielded principles which have been further developed and applied to reveal the new world we see around us. The patent system, the land-grant colleges and universities, the Smithsonian Institution, the National Bureau of Standards, the Naval Research Institute, and the National Science Foundation indicate the importance which the Federal Government has always placed upon the increase and diffusion of knowledge among men and the application of this knowledge to useful arts and sciences for benefit of the Nation at large.
>
> Basic and applied research and the development of useful applications of the principles which are discovered are going on at a remarkably high rate today. We can expect that the current research and development work will result in even greater changes in the world of tomorrow.
>
> According to a survey made by the Bureau of Labor Statistics for the National Science Foundation, on the research and development work performed in 1953, the total of this research and development work amounted to more than

$5 billion during that year. Of this, programs financed by industry amounted to about $2.3 billion, and programs carried on or financed by the Federal Government amounted to almost $2 billion.

In its sixth report on Federal funds for science, the National Science Foundation estimated that the Federal research and development budget for fiscal 1958 would involve expenditures of $3.3 billion, and Business Week of September 21, 1957, estimated the total spending on research in 1957 at $10 billion.

Much of this research and development work will produce commercially valuable products and processes, which will benefit those concerns able to produce and sell them. Unfortunately for the free competitive enterprise system and in the long run for the national economy, a disproportionate share of the research and development is being done by large concerns, while the small concerns are able to do proportionately little research and development work. The National Science Foundation report on science and engineering in American industry in 1953 shows that only 8.3 percent of manufacturing companies with 8 to 99 employees engage in research and development and only 22.4 percent of manufacturing companies with 100 to 499 employees do so, while 94.3 percent of concerns with 5,000 or more employees carry on research and development. The same report shows that manufacturing concerns with less than 500 employees, which have about 35 percent of manufacturing employment, employ only 20 percent of the total scientists and engineers and account for only about 11 percent of the amount spent on research and development. Concerns with 5,000 or more employees, however, which have about 40 percent of manufacturing employment, employ more than 60 percent of the scientists and engineers and account for almost 75 percent of the research and development expenditures by industry.

The vast amounts spent by the Federal Government on research and development also go overwhelmingly to large firms. The Defense Department, which in 1956 accounted for $1.9 billion of the total Federal expenditure of $2.7 billion, reported only about 6 percent of its research and development contracts were with small-business firms in fiscal 1956. The Atomic Energy Commission, which had the next largest research and development program, awarded only 1 percent of its research and development contracts to small business in fiscal 1953, 1954, and 1955.

The advantages to a concern performing this Government research are considerable. In addition to the assured profit on the contract itself, the concern will receive the inside track on substantial procurement contracts which may result from the research. It will also have advance knowledge and probably extra information about new commercial products which may be developed from the research. It will have built up a staff of scientific personnel familiar with the research and be in the best position to develop commercial applications. And in many cases it will be able to obtain

patents, subject, in the case of research for the Department of Defense, only to a license to the Government, leaving commercial exploitation up to the concern. Under these conditions small business concerns must necessarily fall rapidly behind in the competitive race for new products and new processes.

In my judgment, three things can be done which will help to keep small business in the race and will thereby strengthen the free competitive enterprise system and the national economy.

In the first place, every effort should be made to see that small business concerns have a chance to obtain Government research and development contracts. I realize that this cannot be done in every case. In some instances only the large concern can do the research or may be interested in doing the research. Nevertheless, I believe that a vigorous effort should be made to award as many research and development contracts to small businesses as possible. This will be of direct benefit to the small-business concerns and to the economy as a whole.

In the second place, every effort should be made to make available to small business concerns the benefits and results of all of the research and development work done by the Government or at Government expense. If the Government pays for research and pays a price which will yield the concern doing the research a profit, it would seem difficult to justify adding to that profit the right to all the commercial benefits of an invention derived from that research, paid for by the taxpayers, including small business concerns.

In the third place, I believe that arrangements should be made to enable small business concerns to get together to carry on research and development programs, with an exemption from the antitrust laws and the Federal Trade Commission Act. Research and development projects are often extremely expensive and the results do not always pay off at once in measurable profits. A single small business concern may not have the financial resources to carry on over a period the kind of research and development work which would give it an equal opportunity to compete in a new fast-developing market with its giant competitor. However, a group of small business concerns might each be able to devote a fraction of the cost of the research and development contracts and produce something which would benefit not only the small business concerns involved but also the consuming public and the national economy.

This would not be inconsistent with the basic purposes of the antitrust laws and Federal Trade Commission Act. Rather, by increasing the opportunity of small business concerns, it would promote and strengthen the free competitive enterprise system and the national economy as well.

In order to carry out these objectives, I have prepared a bill which will give to the Small Business Administration the duty and authority to pursue these three objectives in the interest of small businesses. Other Government agencies

which have activities in this field will be called upon to cooperate with the Small Business Administration in pursuing these objectives.

This bill will not eliminate the need for other relief for small business concerns, such as tax revisions and measures to provide access to credit. It will, however, serve to reduce substantially one of the handicaps under which small businesses now suffer, and to place them in a more nearly equal position with big businesses in the competitive race for the future. In my judgment, this will be a substantial benefit to the economy of the Nation.

2. *Wendell B. Barnes*, Administrator, Small Business Administration (pp. 560–600), made the following comments on S. 2993.

S. 2993 empowers and directs the Small Business Administration to assist small business concerns in obtaining Government contracts for research and development and in obtaining the benefits of research and development performed by larger firms under Government contracts or at Government expense. Although the Administration is already authorized to provide such assistance, I should welcome the addition to the act of any language which will emphasize the congressional intent in this matter. Such language would serve as a timely declaration that small business must be established as an integral part of the missile program.

The research and development about to be undertaken in that area promises to have widespread effects on our economy. It should generate new processes, new products, and, perhaps, new industries. I should like to see a strong pronouncement from the Congress that, insofar as practicable, small business concerns must be given the invaluable experience that comes from active participation in such work; that, to the extent that they are excluded therefrom, they must be permitted to share in the knowledge acquired by others at the expense of the Government.

In commenting on the contracts awarded during fiscal year 1957. Mr. Barnes said:

Available statistics indicate that in fiscal year 1957, small business firms received only 4.3 percent of the value of military research and development contracts. This low percentage of small-business awards indicates that the scientific knowledge and engineering capacity of small firms are not being utilized to the fullest desirable extent by the Government.

In research and development procurements, Federal agencies seek participation by the best qualified firms, educational institutions, nonprofit organizations, or individuals in order to receive the finest products or studies. The policy places a premium on experience and on superiority of facilities.

The SBA field offices counsel and guide small firms and individuals interested in research and development work, and direct them to the appropriate procurement officials.

The offices also develop additional small-business sources for research and development projects when notified by the agency's representatives at procurement centers that greater small business competition is needed.

The percentage of research and development contracts awarded to small business firms possibly could be increased by use of the joint set-aside program. Accordingly, the agency has instructed its representative at procurement centers to initiate joint set-asides on research and development projects when two or more small business firms have qualified as prospective contractors. This action will give Government procurement officials every opportunity to cooperate in increasing the share of research and development contracts being awarded to small business concerns. To illustrate effective use of the joint set-aside program in this area, of all research and development procurements screened at the Quartermaster Research and Engineering Command at Natick, Mass., during the 6-month period ending December 1957, almost 50 percent of the dollar value was set aside for small business.

Senator Fulbright had received letters from a number of organizations, telling of the importance of increasing the share of military business awarded to small research and development organizations. Some of these included:

(3) *Robert C. Ruhl*, business manager, Miller Research Laboratories, Baltimore, Md., who had the following to report on weapons contracts:

As weapons have become larger and more complex, it is well known that the weapons business has become a highly concentrated one, with considerable resulting loss of business not only to small companies but medium to large as well.

Speaking for small business, the things which we offer in the research and development field are quick delivery, expertness, low cost, and the flexibility to produce under conditions of change and revision. In a freely competitive situation, the small research and development organization needs no prop or protection.

There are many small weapons and subassemblies of large weapons which small business can most efficiently design and produce. I believe that the most important single factor preventing wider use of small and medium companies is the weapons-system concept.

The weapon-system concept is most widely applied by the Air Force, almost as widely by the Navy and to a considerably lesser extent by the Army.

The weapon-system concept is dictated to a considerable extent by technological necessity. That is, up to a point, large weapons require large contractors. Much equipment, however, is included in the weapon system as a matter of military policy and not of technological necessity.

It has been jokingly said that the weapon-system concept has been carried to the point where the military services would like the missile prime contractor to furnish clothing

lockers for the launching crew personnel. Items of equipment normally included in the weapon-system concept now include the following:

1. Testing equipment of various kinds.
2. Personnel training devices.
3. Ground handling equipment.
4. Firefighting equipment.
5. Shipping and storage containers.

All of these items and others can be and should be developed and manufactured by small organizations specializing in them.

One problem in the weapon-system concept, to which the military admits, is that inclusion of auxiliary and supporting equipment in the weapon system defeats the important objective of standardization. Each prime contractor develops his own equipment. This results in duplication in cost during development, and duplication of supporting equipment in the field.

Thus, it is my conviction that elimination of the extremes presently practiced in the weapon-system contracting method would on the one hand, save money, manpower, and equipment; and on the other hand, make a considerable portion of large weapon work once more available to small business.

It has been our experience that the Small Business Administration and small-business specialists of the military services have been completely ineffective in the research and development field—effective though they may be in manufacturing work. In some 200 to 300 requests for bid which I have reviewed in the past 5 years only 1 research and development project was set aside for small business. The schedule and money involved made it impracticable as a small-business project.

(4) *James T. Duffy, Jr.*, Kellett Aircraft, Willow Grove, Pa., reported the following:

> We have been struggling for the past 6 months to keep intact a very capable research and development plant with a sizable engineering department. The total number of men in our organization is approximately 150.
>
> Since large business is taking over the entire systems concept of projects for the Government it makes it even harder for small business to participate in these programs.

(5) *E. F. Pain*, vice president, sales and engineering, Aero Supply Manufacturing Co., Inc., Corry, Pa., described his problem as follows:

> I have been reading with considerable interest of your introduction of bill S. 2993 designed to amend the Small Business Act of 1953 to permit participation of small businesses in programs of research and development.
>
> Of particular interest is the provision to assist small-business concerns in obtaining the benefits of research and development performed under Government contracts or at Government expense. As a small-business organization now

serving the aircraft industry, as we have since 1916, we have been all too well aware of the exceedingly difficult situation which is imposed on small business, and possibly others, relative to inability to obtain basic information under the guise of security restrictions.

I cite as an example the situation with which I am best aware; namely, the difficulties this organization encounters in obtaining classified reports which would be of great benefit in the pursuit of our endeavors. The Armed Services Technical Information Agency, better known throughout the trade as ASTIA, operates under procedures prohibiting the distribution of classified reports to organizations who do not possess that very elusive requirement known as need to know. Normally need to know can be established by possession of a classified contract. However, it is difficult to obtain a classified contract without certain basic information which is maintained under close security surveillance. This obviously is akin to the well-known dog chasing his tail.

We have been a cleared facility security-wise for a number of years. However, we have not had a development contract for the past several years and during that period have been unable to obtain the basic information which we feel would assist us in obtaining such contracts in the future.

I take the liberty of directing your attention to the above situation as being one which I believe is typical of the thoughtless discriminatory action against the smaller fellows. I do hope the passage of your bill will permit this situation to be corrected.

The Committee on Banking and Currency amended H.R. 7963 by adding a new section 9. Subsection (a) of the new section 9 contained an introductory provision reciting the importance of research in today's economy, the difficulties posed for small business in this area, and a declaration of congressional policy to aid small business in these respects in order to strengthen and protect our competitive free enterprise system. Subsection (b) empowered the Administration to aid small business to obtain Government research and development contracts and the benefits of Government-financed research and development. Subsection (c) authorized it to cooperate with other Government agencies in achieving these purposes. Subsection (d) authorized it to work out with small business concerns joint research and development programs, approve agreements providing for such programs (after consultation with the Attorney General and Federal Trade Commission) where he finds they will "maintain and strengthen the free enterprise system and the economy of the Nation," and provided that acts pursuant to such agreements should not be deemed in violation of the antitrust laws or the Federal Trade Commission Act.

d. Action taken, Senate—H.R. 7963

H.R. 7963 was debated in the Senate on July 1, 1958. Mr. Javits sponsored an amendment which would make even more specific the exact activities in which small business might engage in the field of research and development. It (1) empowered the Small Business Administration to give small-business concerns technical assistance in

research and development activities and (2) specified the purposes for which joint programs for research and development might be developed, these latter being as follows:

> To construct, acquire, or establish laboratories and other facilities for the conduct of research;
> To undertake and utilize applied research;
> To collect research information related to a particular industry and disseminate it to participating members;
> To conduct applied research on a protected, proprietary, and contractual basis with member or nonmember firms, Government agencies, and others;
> To prosecute applications for patents and render patent services for participating members; and
> To negotiate and grant licenses under patents held under the joint program, and to establish corporations designed to exploit particular patents obtained by it.

Mr. Javits explained the basis for his amendment as follows:

> Mr. President, this is one of the great areas in which small business is at a disadvantage as compared to big business. Big business is going to spend about $8 billion on research and development in the current fiscal year. Interestingly enough, such expenditures are going up 10 percent, while expenditures for plant and equipment have gone down about 30 percent.
> Partly by reason of what is stated in the bill and partly from the authority of the Small Business Administration, the cooperative activities can be conducted with complete protection against a violation of the antitrust laws, which is covered by the bill itself, and small business can obtain some of the advantages from research and development which are now obtainable only by large aggregations of capital.

Opposition to Mr. Javits' amendment was expressed by Senator Capehart on two grounds, i.e., that the Small Business Administration already had the authority necessary to lend money to support such programs and that it was undesirable to spell out the authorized activities in this way. He felt the program would not work, that it represented a step toward Government in business and Federal incorporation, and that it trespassed upon rights reserved to the States. He said:

> I do not understand how this would mean anything to a small businessman. What small businessman will join with a half dozen other small businessmen to engage in a program of research? I want the Record to show that this proposal will not work. I tried it once myself, and I know what I am talking about. The only thing I see wrong with it is that we are endeavoring by legislation to provide for a sort of charter which corporations must use in connection with their bylaws in order to do these things, which they have a right to do now. I do not like to set up criteria, or at least I do not like to see the Federal Government set up criteria even by printing that sort of thing in a bill. Corporations have the authority to do these things under the State charters they have received.

> I think it is bad practice. In my opinion it is the beginning, possibly, of the wedge of the Federal Government getting into private business and of the Federal Government chartering corporations in the United States. Otherwise, it is a harmless little matter. Probably it will not do any harm or any good.

Mr. Javits' amendment was agreed to. The Senate passed H.R. 7963, as amended, the same day (July 1, 1958).

e. House Conference Report No. 2135

The conference report on H.R. 7963 was submitted on July 9, 1958. Amendment No. 31 was concerned with the provision relating to research and development, and was explained in conference as follows:

> This amendment added to the House bill a new section (sec. 9) establishing a program of assistance to small-business concerns in the field of research and development. Under this program SBA would assist small-business concerns in obtaining Government contracts for research and development and in obtaining the benefits of research and development performed by larger firms under Government contracts or at Government expense. Groups of small-business concerns would also be encouraged to join together for research and development work, with technical and other assistance being provided by SBA, and would be authorized to undertake such joint research and development programs without violating the antitrust laws or the Federal Trade Commission Act. The House recedes.

Both Houses approved the conference report, and the bill became Public Law 536 on July 18, 1958.

3. PUBLIC LAW 536 (85TH CONG.), JULY 18, 1958

Public Law 536 amended the Small Business Act of 1953, making various changes in the interest of promoting a more vigorous and efficient program of assistance to small business. The principal changes were (1) to make the Small Business Administration a permanent agency, (2) to increase the authorization for loans to small business to $350,000 maximum outstanding at any one time to a single firm, (3) to provide for a more equitable share of Government procurement for small business by requiring a new definition of small business for procurement purposes, (4) to reduce the interest rate on direct SBA business loans and on SBA's share of such loans made in participation with private lenders and to eliminate the ceiling on the interest rate on the private lender's share, and (5) to provide the section 9 provisions heretofore discussed, relating to research and development.

Section 9, as finally accepted, provided:

> SEC. 9. (a) Research and development are major factors in the growth and progress of industry and the national economy. The expense of carrying on research and development programs is beyond the means of many small-business concerns, and such concerns are handicapped in

obtaining the benefits of research and development programs conducted at Government expense. These small-business concerns are thereby placed at a competitive disadvantage. This weakens the competitive free-enterprise system and prevents the orderly development of the national economy. It is the policy of the Congress that assistance be given to small-business concerns to enable them to undertake and to obtain the benefits of research and development in order to maintain and strengthen the competitive free-enterprise system and the national economy.

(b) It shall be the duty of the Administration, and it is hereby empowered—

(1) to assist small-business concerns to obtain Government contracts for research and development;

(2) to assist small-business concerns to obtain the benefits of research and development performed under Government contracts or at Government expense; and

(3) to provide technical assistance to small-business concerns to accomplish the purposes of this section.

(c) The Administration is authorized to consult and cooperate with all Government agencies and to make studies and recommendations to such agencies, and such agencies are authorized and directed to cooperate with the Administration in order to carry out and to accomplish the purposes of this section.

(d) (1) The Administrator is authorized to consult with representatives of small-business concerns with a view to assisting and encouraging such firms to undertake joint programs for research and development carried out through such corporate or other mechanism as may be most appropriate for the purpose. Such joint programs may, among other things, include the following purposes:

(A) to construct, acquire, or establish laboratories and other facilities for the conduct of research;

(B) to undertake and utilize applied research;

(C) to collect research information related to a particular industry and disseminate it to participating members;

(D) to conduct applied research on a protected, proprietary, and contractual basis with member or nonmember firms, Government agencies, and others;

(E) to prosecute applications for patents and render patent services for participating members; and

(F) to negotiate and grant licenses under patents held under the joint program and to establish corporations designed to exploit particular patents obtained by it.

(2) The Administrator may, after consultation with the Attorney General and the Chairman of the Federal Trade Commission, and with the prior written approval of the Attorney General, approve any agreement between small-business firms providing for a joint program of research and development, if the Administrator finds that the joint program proposed will maintain and strengthen the free enterprise system and the economy of the Nation. The Admin-

istrator or the Attorney General may at any time withdraw his approval of the agreement and the joint program of research and development covered thereby, if he finds that the agreement or the joint program carried on under it is no longer in the best interests of the competitive free enterprise system and the economy of the Nation. A copy of the statement of any such finding and approval intended to be within the coverage of this subsection, and a copy of any modification or withdrawal of approval, shall be published in the Federal Register. The authority conferred by this subsection on the Administrator shall not be delegated by him.

(3) No act or omission to act pursuant to and within the scope of any joint program for research and development, under an agreement approved by the Administrator under this subsection, shall be construed to be within the prohibitions of the antitrust laws or the Federal Trade Commission Act. Upon publication in the Federal Register of the notice of withdrawal of his approval of the agreement granted under this subsection, either by the Administrator or by the Attorney General, the provisions of this subsection shall not apply to any subsequent act or omission to act by reason of such agreement or approval.

PART 3. PATENT EXTENSIONS

I. HISTORICAL BACKGROUND

In the early days of this country, a considerable number of patents were extended both by special act of Congress and, for a time, by the Patent Office. Between 1809 and 1887, 37 special acts were enacted by Congress, extending the patents of various individuals. Since 1887, only one patent has been similarly extended, to wit, the "Ronson lighter" patent which was extended in 1944 under some unusual circumstances, discussed infra. A table listing these 38 special acts is set forth in appendix C.

Prior to the act of 1836, the power to extend patents was lodged in Congress. At that time, the term of the patent was 14 years and no more. In 1836, jurisdiction over the renewal as well as the first issue of letters patent was conferred upon the Patent Office, subject to numerous restrictions as to the grounds of renewal and the duration of the extended term. The term of 14 years was retained in the act of 1836, but the provision for the extension was 7 years.

By the act of March 2, 1861,[111] this jurisdiction over extensions was withdrawn as to all patents granted after the passage of that act, and Congress thereby became the only source from which an increase of the monopoly created by future patents could be obtained. At the same time, however, the act of 1861 extended the term of patents to 17 years.

This act had its origin in Senate bill No. 10. It repealed section 5 of the act of 1836, which had fixed the term of a patent at 14 years, and section 18 of the same act, which had provided for an extension of the original term for a period of 7 years. This bill, in the form in which it passed the Senate, contained no provision for either extending the term of a patent or for repealing or modifying section 18 of the act of 1836. The House, however, amended the bill by adding a section which read as follows:

> * * * there shall be no further extension of any patent when it shall appear to the Commissioner that the profits of said patent, including sales made by the assignee or assignees of said invention, shall amount to one hundred thousand dollars.

The Senate disagreed with the House provision as to assignees, on the ground that the assignees might be unable or unwilling to give an accounting, and that the inventor could not compel them to do so. The bill then went to a conference committee. Up to this time it had not contained any provision either to change the duration of patents or to repeal the law providing for their extension. The conference committee struck out the entire section, and substituted the short one, which stands as section 16 of the act, reading as follows:

> That all patents hereafter granted shall remain in force for the term of seventeen years from the date of issue; and all extension of such patents is hereby prohibited.

[111] 12 Stat. 246 (1861).

Since the act of 1861, there have been numerous attempts to grant extensions of patents, both through general legislation and through legislation on specific cases. The basis for this has been well stated by Robinson who, in his treatise on the law of patents, concludes:[112]

> From the earliest history of patent law the fact has been recognized that through various causes an inventor may fail to obtain an adequate recompense for his inventive skill during the original term of his patent, and that justice to him and a due regard to the public interest may thus sometimes require an extension of his monopoly in the invention.

In the 57th Congress (1902), the first attempt to allow for an extension through general legislation, was made with the introduction of four bills. These were:

S. 6313 and S. 6314, June 30, 1902 (Mr. Bate) and H.R. 15332 and H.R. 15333, July 1, 1902 (Mr. Moon).

S. 6313 and H.R. 15332 provided that a patentee might apply, not less than 90 days nor more than 9 months prior to expiration, for an extension of his patent, setting forth the reasons therefor and his receipts and expenditures on account thereof. The Commissioner would then publish the application in the Official Gazette, obtain a preliminary report from the principal examiner of the class involved, and then refer the matter to the Court of Claims to determine whether the patentee—

> without neglect or fault on his part, has failed to obtain from the use and sale of his invention or discovery a reasonable remuneration for the time, ingenuity, and expense bestowed upon it and the introduction of it into use, and that it is just and proper, having due regard to the public interest, that the term of the patent should be extended.

The court would then order the extension, for a term not to exceed 17 years.

S. 6314 and H.R. 15333 contained similar provisions, except that the proceedings would be before the Commissioner and the extension made by him.

Mr. Joseph Edson,[113] in a treatise on patent extension, argued for the passage of legislation to allow the Patent Office to grant patent extensions. He said:

> The unreasonableness of expecting a committee, whose membership is subject to such large and frequent changes from one Congress to another, to take up and consider several hundred applications for extensions each year, the proper disposition of which, in justice to the public, as well as to the applicants, would require special knowledge of a difficult branch of the law and a technical knowledge in nearly every art, is so apparent that it has only to be stated to secure a prompt admission.

[112] William C. Robinson. The Law of Patents for Useful Inventions, vol. II, p. 642 (1890).
[113] Joseph R. Edson. "Extension of Letters Patent," S. Doc. 6, 59th Cong., special sess. (1907).

By way of example, Mr. Edson wrote:

> At a recent hearing of a private bill before the Senate committee for the extension of a patent which was about to expire, leaving the inventor without any reward for his invention, in the development of which he had spent nearly 30 of the best years of his life and had expended all he was worth when he began, all he had made during the said 30 years, and all that he had been able to borrow from friends and business acquaintenances who had confidence in him personally and in his genius as an inventor, and had nevertheless not been able to place his improvement upon the market, although he now had the promise of capital to do so in view of the recent demonstrations of the practical utility of his improvement, a member of the committee said to the writer: "Do you know of any objection to favorable action on your client's case other than that it would make a precedent upon which to claim favorable action on other applications?"
>
> On another occasion while pressing for favorable action of the House Committee on Patents on a private bill for the relief of a client, Samuel H. Jenkins, who had impoverished himself in efforts to induce capitalists to promote his patent (a bill which like all such bills filed within the last 15 years failed to receive favorable consideration), and having frequently expressed my surprise at not receiving notice of favorable action, a member of the committee finally said to me: "Mr. Edson, you have a good case and your client is justly entitled to have his bill favorably considered, but the fact of the matter is there are plenty of other cases just as meritorious as yours, and if we should act favorably upon your case it would be a precedent for others to follow, and we would soon have more applications then we could possibly consider." I mention these incidents merely to show that the adverse action of the committees of Congress on applications for extensions is not due to their hostility either toward inventors or to a revival of one of the salient features of the American patent system; namely, extensions of patents in proper cases, but is due to the well-grounded belief that if they encourage applications for extensions by making favorable reports on private bills, it would in a very short time be a physical impossibility to hear the number of applications that would be made. I became fully satisfied by my experience that the obstacle to obtaining extension of patents was in the mode of procedure—private bills—and not in the relief sought, and that therefore some general law should be passed which would give some court, board, or commission jurisdiction of the hearing and determination of applications for extensions, and I accordingly prepared and secured the introduction of the two bills as heretofore stated.

Despite the efforts to enact this legislation, these bills were given no further consideration by the Congress, and the act of 1861 remained the law.

II. GENERAL EXTENSIONS NOT INVOLVING WAR CONDITIONS

A. PROPOSALS DURING THE 1930's

There have been almost no proposals in recent times for a general extension of patents, apart from those resulting from war conditions. Two exceptions to this rule are as follows:

1. S. 1591, May 1, 1933 (Mr. Copeland)—73d Congress, provided:

> That any letters patent which were unexpired on March 4, 1933, and have not subsequently expired, are hereby extended for a term of five years after the date now fixed by law for their expiration;
>
> Any letters patent which have expired subsequent to March 4, 1933, are hereby renewed and extended for a term of five years after the date of their expiration.

2. S. 2775, May 7, 1935 (Mr. Johnson)—74th Congress, provided:

> That all letters patent granted for any process of fermentation are hereby renewed and extended for a period of time equal to that part of the term of such patent that fell within the period the eighteenth amendment to the Constitution was in effect.

III. GENERAL EXTENSIONS UNDER WAR CONDITIONS

A. WORLD WAR I

1. H.R. 13043, JUNE 24, 1926 (MR. VESTAL)—69TH CONGRESS

H.R. 13043 provided for extension of the patents of veterans covering inventions patented prior to November 11, 1918, and who had suffered a loss of income therefrom because of military service. This bill passed the House and Senate, was signed by the President, but not by the Vice President (at that time, the signature of the Vice President was necessary for the bill to be enacted).

2. PUBLIC LAW 623 (70TH CONG.), MAY 31, 1928

a. H.R. 10435, February 2, 1928 (Mr. Vestal)

H.R. 10435 permitted the extension of a patent issued to a veteran prior to November 11, 1918, and who suffered a loss of income because of his term in service.

The bill read, in part, as follows:

> *Be it enacted* * * * That any person who served honorably in the military or naval forces of the United States at any time between April 6, 1917, and November 11, 1918, both dates inclusive, and was subsequently honorably discharged, may within six months after the enactment of this act, upon payment of a fee of $20, make application to the Commissioner of Patents, comprising a verified statement, accompanied by supporting evidence of the following facts:
>
> (A) That he is the inventor * * * of an invention * * * for which a patent was granted prior to November 11, 1918,

the original term of which remains unexpired at the time of filing * * *.

* * * * *

(F) The period of extension * * * shall in no case exceed a further term of three times the length of his said service in the military or naval forces * * *.

b. Hearings and significant testimony

Hearings were held before the House Committee on Patents on March 23 and April 13, 1928, on H.R. 10435.

Testifying in favor of the legislation were representatives from the American Legion and the Disabled Veterans.

(1) *Col. John Thomas Taylor*, National Legislative Committee, American Legion (pp. 2–7), explained his reasons for favoring the bill as follows:

> This bill won't cost the U.S. Government a single penny. We contend that when this Government granted a patent to these men, the Government entered into a quasi contract with them for a period of 17 years. Then along came the war and there was a bigger contract, a much bigger contract, and the Government reached over and just took these men and put them in the service. The second contract that the Government entered into with the men, the contract for them to perform military service, interfered with this first contract to such an extent that they were not able to develop the possibility of making some money out of their patents.

(2) *James F. Smathers*, Legionnaire (pp. 15–20), told of his own experience of loss on his invention.

> In 1913 I secured a patent and my means were very limited and I had to work a while and pay a modelmaker, then work a while again. So the years went by and I get a model built and was just about to make some arrangements for marketing it, or planning at least for marketing it, when the war came on. * * *
>
> I went into the Army in November 1917, went overseas and was brought back home and discharged in June 1919, approximately 21 months after entering the Army. I had borrowed money and had made fair arrangements for carrying on my development work before I joined the Army. When I came back all those financial plans were disrupted; the banks knew I did not have anything and I could not resume my borrowing from them, as I had done prior to the time I went away. So I first had to turn in and work for a year or two to revamp my bank account before I could even start to make models, and in about 1921 I was able to get another model done and to start again along the course of planning and marketing my invention, and in 1923 I succeeded in making arrangements whereby a manufacturing concern took over the engineering and development work.
>
> Mr. LANHAM. In other words, but for your service in the war you could have brought this up to the point that you did in 1923 at a much earlier date?

> Mr. SMATHERS. I had practically the same kind of an arrangement made and completed in 1917 as was finally completed in 1923. I had some men connected with manufacturing concerns in the East under a tentative contract at the time, and it was to pay me a royalty and a certain interest in the invention, and that is practically the same arrangement I have today.

Another point brought up in the discussion was that there were still men in the service after the signing of the armistice, and Mr. Lanham thought that the date ought to be fixed with reference to the date of enlistment and the period of service. Colonel Taylor thought that the committee should fix the date as the date Congress itself terminated the war, i.e., July 2, 1920.

Opposition to the bill came from the Commissioner of Patents, representatives of the National Association of Manufacturers, and from the American Patent Law Association.

(3) *Thomas E. Robertson*, Commissioner of Patents (pp. 21–23), objected to the bill on the grounds that it was not fair to the manufacturer who had spent money and time in preparation for manufacture as soon as the patent expired. He explained:

> The fundamental objection I made was that no bill giving general relief should be passed, but that when anyone had a case in which an extension was justified, relief should be passed for that particular case. Because in the passing of a bill giving general relief we are likely to do damage in places where we could not see where the damage would be wrought. Now, the bill has been amended to take care of those who have licenses under existing patents, if those patents might be extended by this bill, so as to provide that the licensees may continue to manufacture under the terms of the existing license.
>
> If there is not a clause in this bill taking care of those who have obtained improvement patents, and permitting them to use their inventions and not be blanketed by any extended patent, there should be. But even if there is such a provision, my point is that this does not take care of the manufacturer who has not yet really begun to manufacture but who may have expended $100,000 or $200,000 or maybe half a million dollars preparatory to manufacturing just as soon as the patent expires.

Mr. Robertson was asked whether or not clause H would take care of these manufacturers. Clause H was:

> That such extension shall in no way affect the right of anyone who before the passage of this act was bona fide in possession of any rights in patents or applications for patents.

He answered that the clause would take care of the improvement patents but not of the man who has spent a hundred thousand or a million dollars getting ready to manufacture, and was waiting for the patent to expire before actually starting to manufacture. If suddenly the patent were extended a few years, the man's investment would be wasted.

Mr. Robertson said that as an alternative to the present bill, the Commissioner of Patents could be given power, subject to opposition and to review by the courts, to determine whether an applicant deserved an extension or not.

For example:

> * * * suppose that John Doe wants an extension of a patent, and under the terms of the bill he will have 5 years' extension granted to him, if any. John Doe should be made to show two things, the things set forth in this bill; to wit, that he was doing his best to put it on the market at the time he was inducted into service, and so on; and that there is a hardship resulting; and then the bill should provide that anyone who is damaged by the extension, the possible extension, should have a chance to come and oppose it, and then this committee or the Commissioner of Patents or the Secretary of Commerce or some court should be given power to decide whether the facts in that case justify extension.

He added:

> But I think that in view of the fact that proponents of this bill think there is going to be only a few applications for extension, it would be better to have them sifted out, even at the expense of additional work on the Patent Office, or some court if you wish, rather than to pass a blanket bill giving extension to people that you have no idea of now, and affecting vital interests, the biggest interests of the country, you may say. You do not know. You cannot tell where it will reach.

c. Action and enactment of H.R. 10435

H.R. 10435 was favorably reported out in the House and Senate Committees on Patents (H. Rept. 1314 and S. Rept. 1296).

The House committee, in issuing its report on April 19, 1928, stated:

> When war was declared in April 1917, and the conscription act was passed, all able-bodied men were called to the colors, including men who were the holders of patents; and it has developed that a few of them, at least had started to build organizations for the development of the invention on which a patent had been issued, but the call to war caused a necessary abandonment of such organization, and the invention and development were left at a standstill while the men were in service.
>
> The purpose of this legislation is to extend the monopoly given to these men, if by reason of the fact that they were taken into service, they lost the income that they would otherwise have received, or if that income was reduced during the time spent in the military service.
>
> The committee feels that in cases of this kind these men are entitled to have the time limitation of their patents extended, and the bill is drawn so as to extend the monopoly for a period three times the length of the service in the World

War, which the committee believes is equitable and just, based upon the varying lengths of time that different men were in the service.

The Senate committee issued its report on May 3, 1928. It was almost identical to the House report, quoted in part, above.

H.R. 10435, permitting the extension of a patent to any person who served honorably in the military or naval forces of the United States at any time between April 6, 1917, and November 11, 1918, was signed by the President on May 31, 1928, becoming Public Law 623.[114] Six patents were extended under this act.

B. WORLD WAR II

1. H.R. 1190, JANUARY 8, 1945 (MR. O'HARA)—79TH CONGRESS

This bill was introduced during World War II, and provided for the extension of the term of patents in the case of persons serving in the armed services during the war.

It provided:

> SEC. 1. That any person serving in the land or naval forces of the United States at any time during the period beginning December 7, 1941, and ending on the date of the termination of hostilities in the present war, as proclaimed by the President, who is on active duty, or who has been discharged or relieved from active service under honorable conditions, and who desires to secure extension of the term of a patent pursuant to this Act, may within six months after the date of his discharge or release from such service, whichever is the later, upon payment of a fee of $20, make a written application to the Commissioner of Patents, containing as a part thereof a statement setting forth—
>
> (A) that * * * [his patent] was granted prior to his entry into or during his period of service * * * the original term of which [patent] remains unexpired at the time of filing of the application;
>
> * * * * *
>
> (D) the period of extension * * * shall in no case exceed a further term of three times the length of his said service * * *
>
> * * * * *
>
> (F) that such extension shall in no way impair the right of anyone who before the date of enactment of this Act was bona fide in possession of any rights in patents or applications for patents conflicting with the rights in any patents extended under this Act, nor shall any extension granted under this Act impair the right of anyone who was lawfully manufacturing before the date of enactment of this Act the invention covered by the extended patent.
>
> * * * * *

[114] 45 Stat. 1012 (1928).

SEC. 3. On the filing of such application * * * the Commissioner shall cause notice of such application to be published at least once in the Official Gazette. Any person who believes that he would be injured by such extension may within forty-five days from such publication oppose the same on the ground that any statement in the application for extension is not true in fact, * * * In all cases where notice of opposition is filed the Commissioner of Patents shall notify the applicant for extension thereof and set a day of hearing. If after such hearing the Commissioner is of the opinion that such extension should not be granted, he may deny the application therefor, stating in writing his reasons for such denial. Where an extension is refused, the applicant therefor shall have the same remedy by appeal from the decision of the Commissioner as is now provided by law where an application for patent is refused. * * *

2. H.R. 6346, MAY 7, 1946 (MR. RICH)—79TH CONGRESS

This bill was similar to H.R. 1190 (79th Cong.). However, it imposed in section 1 two additional conditions that the patentee must meet to be eligible for an extension:

> (C) That between December 7, 1941, and the date of enactment of this Act, he was not receiving from said patent an income, or that his income therefrom was reduced by his said service.
>
> (D) That at the time of his induction into the service he was making diligent effort to exploit the invention covered by his patent.

H.R. 6346 was submitted to the House Committee on Patents, and was reported out July 27, 1946 (H. Rept. 2686), with seven amendments which, however, did not change the original bill very much. The committee said:

> Under existing law, the Government grants to the patentee the exclusive right to make, use, or sell his patented invention within and throughout the United States and its territories for a limited period of time (17 years). In other words, in consideration of the patentee's disclosing his secret to the world, Congress has provided the patentee with the exclusive right to practice his creation during the time mentioned. The courts have held that this is a contract. The bill would tend to complete the Government's part of the bargain by restoring to the patentee that which he would have enjoyed but for the interruption caused by the war.
>
> When World War II was declared, the Selective Service Act was passed, and all able-bodied men were called to the colors, including men who were the owners of patents or who had rights under them; and it has developed that a few of them started to form or had formed organizations for the development of their patented inventions. The call to war, however, necessitated the temporary abandonment of their plans to exploit their inventions. The purpose of this legisla-

tion, therefore, is to make it worthwhile for servicemen to resume their prewar activities under their patents. More particularly, it is designed to extend the terms of the patents granted to such persons, if by reason of their service they lost income which they otherwise would have received; or if such income was reduced during the time of their service.

The committee feels that in cases of the kind mentioned persons who served in the military or naval forces during the present war are entitled to have the time limitation of their patents extended, and the bill is drawn so as to accomplish that purpose.

H.R. 6346 passed the House on July 27, 1946 (Congressional Record, p. 10296). No action was taken by the Senate.

3. OTHER BILLS OF THE 79TH CONGRESS

H.R. 718, January 4, 1945 (Mr. Elston). This was a more general bill providing that whenever, due to a war or unforeseen circumstances, valuable patent rights have lapsed or will lapse without the patent owners obtaining a reasonable reward or remuneration, the President shall have the power to extend said patents for an additional term not to exceed 17 years.

H.R. 2043, February 7, 1945 (Mr. Rowan). This bill was similar to H.R. 718 (above).

H.R. 3069, April 27, 1945 (Mr. Grant of Indiana). This was a general bill providing that all patents unexpired on the date of enactment of this act are extended for a period equal to the period beginning on December 7, 1941, and ending on the date of the termination of the war as proclaimed by the President or declared by concurrent resolution of the Congress.

H.R. 6071, April 10, 1946 (Mr. Beall). This bill combined the inability to manufacture due to war material shortages, etc., with the inability to exploit an invention because of service in the armed services. The extension was to be for twice the period in which the patentee failed to receive income from the patent. The extension was in no way to impair the rights of others in the patent.

S. 840, April 6, 1945 (Mr. Capehart). This bill was similar to H.R. 3069 (above).

4. BILLS INTRODUCED IN THE 80TH CONGRESS UPON WHICH HEARINGS WERE HELD

a. Provisions

H.R. 65, January 3, 1947 (Mr. Grant of Indiana). This bill was similar to H.R. 3069 and S. 840 of the 79th Congress.

H.R. 124, January 3, 1947 (Mr. O'Hara). This bill was similar to H.R. 1190 and H.R. 6346 of the 79th Congress.

H.R. 1107, January 20, 1947 (Mr. Rich). This bill was similar to H.R. 6346 of the 79th Congress.

H.R. 1984, January 17, 1947 (Mr. Stratton). This bill was similar to H.R. 2043 of the 79th Congress.

b. Hearings

Hearings were held on these four bills by the House Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, April 2, May 9 and 14, 1947.

Witnesses appearing before the committee were as follows:

(1) *Francis D. Stephens*, chairman, law and rules committee of the American Patent Law Association (pp. 11–16), told the committee that his organization voted to oppose the passage of all four bills. He said:

> The vote in this direction was because the association is in principle against the passage of any bill which would extend the life of any patent, although we realize that there are special hardship cases, as where fraud has been involved, in which justice demands that the life of a patent should be extended.
>
> * * * * *
>
> In general, the reasons for this opposition lie in the fact that the patent system is extremely complex. There are hundreds of thousands of valid patents, patents on which the 17-year period has not yet run out. Some of these patents, a great many of them, perhaps, are worthless. A great many of them are extremely valuable. Because of the number of them, industry must watch very closely as to where they stand with respect to valid patents.
>
> In anticipation of the expiration of a patent, certain industries may start to acquire materials, build plants, or lay plans for getting into a market which was heretofore held under a patent monopoly. A considerable investment may have been made. Then if the life of that controlling patent is extended, industry suffers.
>
> * * * * *
>
> The members of my association feel in general that all patent rights were curtailed during the war, the same as all private rights and efforts were curtailed during the war. In other words, while it is true that a serviceman suffered by not being able to exploit his patent rights, it is also true that a civilian owner of a patent could not exploit his patent rights because (1) he may have been engaged in war service, such as by working in a shipyard; and (2) industry was geared to the war effort and materials and labor were not available to the manufacturer to use and sell an invention which was set forth in his patent.
>
> Mr. KEATING. Perhaps the test should not be that, but was the contribution of the veteran such to his country that he is entitled to some extra consideration by reason of that?

(2) *P. J. Federico*, law examiner, U.S. Patent Office (pp. 19–27), stated that the position of the Patent Office in the past has been to oppose, in principle, proposals for extending the term of issued patents.

He stated the various reasons for opposing the particular bill as follows:

> H.R. 65 corresponds to H.R. 3069 and S. 840 of the 79th Congress. This bill provides for the general extension of all patents which were in force during the war for a period equal to the duration of the war, or in the case of patents which were granted or which expired during the war, for a period equal to the time that the patent was in force during the war.
>
> There are no restrictions, no limitations, just a blanket extension of all patents that were in existence during the war period. Of course, administration in a bill of this kind would be nonexistent, because the law automatically would extend the term of all the patents. Roughly, there might be more than 100,000 patents that would be involved.
>
> The bill is not limited to those patents which were affected by the war—where the patentee was unable to operate because of war conditions—but includes all patents, even those where the war may have caused the patentee to obtain greater profits than he would have otherwise.
>
> H.R. 1984 is practically the same as H.R. 2043 of the 79th Congress. It provides for the extension of the term of any patent when the patent owner had not obtained a reasonable reward or compensation for his efforts due to the war, periods of national emergency, or unforeseen circumstances. In this bill, the extensions are limited to a certain class of patents, but they are not limited to those that were affected by the war, the bill applies to patents that were affected by an unforeseen circumstance which may arise in the future.
>
> H.R. 1107 is a duplicate, with one exception, of H.R. 6346, as it passed the House of Representatives. * * * The bill * * * is patterned after the law enacted in 1928, and differs only in a few respects from it. * * * The general position of the Patent Office in opposition to extensions of patents applies to bills of this kind, and the Patent Office has in the past opposed legislation to extend patents to compensate for the war period, including bills on behalf of persons that served in the military services.

(3) *Col. George W. Gardes,* representing the War Department (pp. 27–28), said that the War Department was not in favor of H.R. 65 and H.R. 1984 because they provided benefits to patent owners without requiring the showing of injury or loss as a result of war, and would afford unjust enrichment. They would also create a "future and presently incalculable potential liability for the patent infringement by the War Department as well as by other Government agencies."

(4) *Hon. Fritz G. Lanham,* former Congressman and member of the House Patents Committee (pp. 32–36), said that he was opposed to the general legislation. He felt that the veteran should be required to show that he was injured materially with reference to the advantages that he might have obtained under his patent.

c. Reports

At the conclusion of the hearings, the subcommittee prepared a clean bill, H.R. 4304, which was reported out by the committee (see infra).

5. H.R. 4304, JULY 21, 1947 (MR. LEWIS)—80TH CONGRESS

This bill was similar to H.R. 1190 of the 79th Congress. It was reported out by the House Committee on the Judiciary, with two minor amendments in wording, on February 9, 1948 (H. Rept. 1360). The committee referred to the hearings which were held the previous session, saying:

> Representations were made and were seriously considered by the committee that the benefits of such legislation should inure to all patentees who suffered losses by reason of being unable through shortages of materials or other reasons during the war to prosecute and exploit their patent rights. The committee, however, felt that to provide relief for all such persons who suffered losses in this manner would be to overlook the many thousands of persons in other walks of life who suffered grievous and irreplaceable losses in their fortunes because of the circumstances of war. For most of such persons no governmental relief has been or could reasonably be afforded, for such conditions cannot reasonably be considered by thinking persons the responsibility of the Government to restore.
>
> As to veterans of World War II, however, the committee could perceive a reasonable and logical distinction, for in these cases the circumstances of the removal of the patentees from the scenes of their livelihoods and occupations, and the involuntary (in most cases) nature of their having military or naval duties thrust upon them, effectively deprived them of their freedom to exploit their patent rights even if materials, etc., had been available. Of course, there were many whose patents produced a steady and undiminished income during their absence in service, but as to these the bill makes adequate provision.
>
> The bill further carefully protects the innocent persons who might unwittingly and legally be manufacturing a patented invention after the expiration of its original term and then finds that the extension of the period creates a technical infringement. In such cases the continued manufacture is permitted, subject only to the payment of a reasonable royalty.

This bill passed the House on March 1, 1948 (Congressional Record, p. 1938), but no action was taken in the Senate.

6. OTHER BILLS OF THE 80TH CONGRESS

H.R. 4511, November 18, 1947 (Mr. Sabath).
H.R. 5452, February 17, 1948 (Mr. McGarvey).

7. PUBLIC LAW 598 (81ST CONG.), JUNE 30, 1950

Public Law 598 [115] had its origin in H.R. 4692, introduced on May 16, 1949, by Mr. O'Hara. It was similar to H.R. 4304 (80th Cong.). Hearings were again held by a subcommittee of the House Judiciary Committee; witnesses testified pro and con. The House Committee

[115] 64 Stat. 316 (1950), 35 U.S.C. sec. 115 (1952).

on the Judiciary issued its report on August 8, 1949 (H. Rept. 1214), and the Senate on October 17, 1949 (S. Rept. 1190). H.R. 4692 passed the House on August 15, 1949, and the Senate, with amendments, on October 18, 1949.

As the Senate passed the bill, it extended the term of patents held by members of the armed services for an additional amount of time equal to the amount of time they spent in the services. On the other hand, the bill, as passed by the House, would have extended the term for twice that long. A conference was held (H. Rept. 1880), and the conferees agreed with the position taken by the House of Representatives, and on June 19, 1950, the House and Senate agreed to the conference report. H.R. 4692 was signed into law on June 30, 1950, becoming Public Law 598. One hundred and thirteen patents were extended under this act.

8. OTHER BILLS INTRODUCED IN THE 81ST CONGRESS

Other bills introduced in the 81st Congress, but on which no action was taken, included—

H.R. 98, January 3, 1949 (Mr. O'Hara).
H.R. 3135, March 1, 1949 (Mr. McConnell).
H.R. 4071, April 7, 1949 (Mr. O'Hara).
H.R. 4155, April 9, 1949 (Mr. Gorski).
H.R. 8884, June 21, 1950 (Mr. Walter).
H.R. 9366, August 9, 1950 (Mr. Reed).
S. 1854, May 13, 1949 (Mr. Douglas).

9. PUBLIC LAW 437 (82D CONG.), JUNE 1, 1952

Public Law 437 [116] had its origin in S. 1537, introduced by Mr. Magnuson on May 23, 1951. H.R. 4413, introduced by Mr. O'Hara on June 12, 1951, was considered at the same time. The purpose of these bills was to amend Public Law 598 (81st Cong.). Under that law, a veteran received the benefits incident to the extension of his patent provided he were the sole owner of the patent. This amendment would extend that coverage to veterans who owned patents jointly with their spouses.

S. 1537 was reported out in S. Rept. 1441 and H.R. 4413 in H. Rept. 1716. S. 1537 passed the Senate on May 1, 1952. The House passed H.R. 4413 on May 5, 1952, and the amended S. 1537 on May 15, 1952. It was signed by the President on June 1, 1952.

C. POST-WORLD WAR II AND KOREAN CONFLICT

1. BILLS INTRODUCED IN THE 82D CONGRESS, UPON WHICH HEARINGS WERE HELD

a. Provisions

H.R. 323, January 3, 1951 (Mr. Reed of Illinois). It provided:

> that the term of any patent shall be extended to such extent as the normal use, exploitation, promotion, or development of such patent has been prevented, impaired, or delayed by reason of—

[116] 66 Stat. 321 (1952), 35 U.S.C. sec. 118a (1952).

(a) the granting of a license to the United States without payment of royalty or at a nominal royalty;

(b) any restrictions or prohibitions imposed by the United States by reason of a war or other national emergency; or

(c) any circumstance beyond the control of such owner or holder or resulting from the existence in the United States of a state of war or other national emergency.

H.R. 4054, May 10, 1951 (Mr. Walter). It provided:

that the term of any patent may be extended in accordance with the provisions of this act if the normal return has been prevented, impaired, or delayed, during the period beginning May 27, 1941, through November 4, 1945, inclusive, by reason of inability to obtain materials due to the fact that materials required were subject to Government priorities or allocations.

Both bills contained procedural provisions which contemplated application to the Commissioner for an extension, with review by the Court of Customs and Patent Appeals. Both provided an absolute exemption of the United States from all liability during the extended term; an exemption for things made and sold in the period between expiration of a patent and its revival for an extended term; and a provision allowing licensees either to cancel or to continue on the same terms for the extended period. Both bills provide for an extension for a period "commensurate with the extent to which normal economic return from such patent was so prevented, impaired, or delayed."

b. Hearings

Hearings on the above bills were held before Subcommittee No. 3 of the House Committee on the Judiciary on June 20 and 22, 1951.

(1) *Representative Francis E. Walter* (pp. 4–6) testified in favor of his bill, H.R. 4054. He said:

I believe that everyone admits that America's inventive genius has helped to make this country great. No one seriously questions the wisdom of protecting the inventor through an effective patent system. * * * The patent is a property right, of which the owner cannot be legally deprived, even by the Government, without the payment of just compensation. But, what of the deprivations that result when the Government, through restrictions, priorities, and allocations, has effectively prevented use of a patent during 4 or 5 of those 17 years?

It is a basic principle of jurisprudence that he who grants a right, also impliedly covenants that he will not deprive the grantee of the enjoyment of that right. * * * Even in the field of patents, this committee and Congress have repeatedly recognized this essential justice in particular cases.

The trouble is that heretofore we have attempted to deal with the matter piecemeal, by private bills for relief of

> individuals or special groups. As the law now provides no machinery for granting justice to injured patentees, this subcommittee frequently has been called upon to consider individual cases through the instrumentality of private bills. It is no disparagement of this subcommittee to say that it is not equipped to pass on the merits of individual claims. That is a burden which should not be thrust on any congressional committee.
>
> In most foreign countries, I understand, the law provides for prolongation of patents, when their enjoyment has been frustrated by governmental restrictions.
>
> I believe it is high time that the law in this country should do justice along similar lines. Congress should lay down a general rule and permit its application to individual cases through administrative or quasi-judicial channels. That is the purpose of H.R. 4054. * * *

(2) *John Hoxie*, chairman of the committee on patent law and practice, New York Patent Law Association (pp. 6–20), presented a report by his association, which summarized its conclusions opposing the bills as follows:

> The committee is opposed to both bills in principle because it believes—(1) that they rest on a misapprehension of what the patent right is; (2) that they are inherently discriminatory; and (3) that the administrative problem of granting extensions for the reasons made operative by these bills would be unduly great.
>
> The committee is further opposed to H.R. 4054, and to H.R. 323 in its comparable effect, because too much time has elapsed to permit equitable redress now for World War II situations.
>
> The committee also opposes the extension, under any circumstances, of expired patents, a result contemplated by both bills. As applied retroactively to World War II situations, such extensions—really revivals—would recreate inequity in their effect upon investments, commitments, and plans made in reliance on the normal expiration of patents. In its prospective application, H.R. 323 would create an uncertainty as to the expiration of all patents, which would unduly burden and impede industrial development.

(3) *William B. Barnes*, an inventor (pp. 85–91), was one of several representatives from small businesses and individual inventors who testified in favor of the legislation, telling of their losses during the war because of inability to get materials and equipment. Mr. Barnes described the difficulties that the independent investors and small businessmen face in making the most of inventions, and the obstacles they must overcome. Some of these were (1) the invention must be marketable; (2) the timing must be good; (3) advantageous commercial arrangements must be made; and (4) domination by prior patents must be avoided. In the face of these difficulties, Mr. Barnes said:

> the surprising thing is that a man is still willing to take his chances in the field of invention. He does it only because society makes with him a bargain. In return for the full dis-

closure of a new and useful invention, society grants to him the right to practice it (if he can also overcome these hurdles) and exclude others from so doing, for an intended period of 17 years. He delivers his part of the contract; he naturally expects society to do the same. Having overcome these hurdles he has the right to expect that society itself will not interpose unexpected hurdles of its own, to interfere with what returns he can derive from his efforts at invention. If, however, society itself does interfere with his exploitation of the invention for any portion of that 17-year period, the inventor is in the position of one who has delivered his part of a contract and finds himself shortchanged by the other party to the bargain.

(4) *Paul A. Rose*, chairman, committee on laws and rules, American Patent Law Association (pp. 93–102), said that the American Patent Law Association was opposed in principle to the extension of the terms of patents as proposed in the bills under consideration. Such extensions, he stated, were not believed to be in the public interest or in the interest of the patent system in this country. They were also contrary to the established policy of the Congress against extension. The proper remedy, according to the association, would be by way of special legislation restricted to individual patents, rather than general legislation.

These bills were not reported out of committee, and no further action was taken on them.

2. OTHER BILLS INTRODUCED IN THE 82D CONGRESS

H.R. 3231, March 14, 1951 (Mr. Davis of Wisconsin).
H.R. 7394, April 4, 1952 (Mr. Budge).
H.R. 7552, April 23, 1952 (Mr. Magnuson).
S. 1986, August 9, 1951 (Mr. Dirksen).
S. 3096, May 1, 1952 (Mr. Dworshak).

No hearings were held on any of these bills and they received no further action.

3. BILLS INTRODUCED IN THE 83D CONGRESS, UPON WHICH HEARINGS WERE HELD

a. Provisions

H.R. 1228, January 7, 1953 (Mr. Budge). It proposed to amend the act of June 30, 1950, to allow an extension to "persons, firms, or corporations as coowners of patents." This would increase the coverage of the law, which at that time allowed an extension to the inventor-veteran only if he were sole owner of the patent or coowner with his wife.

H.R. 1301, January 7, 1953 (Mr. Reed). This bill was similar to H.R. 323 (82d Cong), described supra, p. 164.

H.R. 2309, January 29, 1953 (Mr. Scott). It contained the following provisions:

> (a) it is the policy and purpose of this act to provide for the extension of the term of any patent where—
>
> (1) to further the interests of the United States of America, the owner of such patent has heretofore granted

a license thereunder to the United States, or to manufacturers, producers, or contractors authorizing them to produce or furnish goods or services for or to the United States, without payment of royalty, or at a nominal royalty, such license having been granted by the owner to promote any war effort, or any program of rearmament or preparation for the national defense, in which the United States has been engaged since the invasion of Poland by Germany on September 1, 1939;

(2) since September 1, 1939, under the authority of such license, the United States, or manufacturers, producers, or contractors furnishing goods or services to the United States, have made substantial use of the invention embodied in such patent in the production or furnishing of goods or services for or to the United States, such use of said invention having been of material assistance and benefit to the United States in connection with any war effort, or any program of rearmament or preparation for the national defense;

(3) the owner of such patent is willing to grant a license thereunder to the United States authorizing the use of the invention embodied in such patent in the production or furnishing of goods or services for or to the United States, without payment of royalty, for the period beginning on the date of expiration of the initial license granted by such owner, and continuing to the date of the expiration of the said patent as extended hereunder; and

(4) such owner is willing to release any and all claims for any infringement of such owner's patent, or any unauthorized use of the invention embodied therein, in the production or furnishing of goods or services for or to the United States, which the owner may have against the United States, or against any manufacturer, producer, or contractor who has produced or furnished goods or services for or to the United States.

(b) In such circumstances the term of any such patent shall be extended for a term equal to the period during which the initial license granted by the owner of such patent, without payment of royalty, or at a nominal royalty, was in effect after September 1, 1939, the term of such extension to begin on the date of expiration of the original term of such patent. * * *

H.R. 3534, February 26, 1953 (Mr. Crumpacker), provided:

That (a) if at any time during any of the periods specified in subsection (d) of this section—

(1) the term of any unexpired patent of the United States included time during which any individual owning not less than a 50 percent interest in such patent was performing honorable service on active duty in the Army, Navy, Air Force, Marine Corps, or Coast Guard; or

> (2) the practice of the inventions described and claimed in any unexpired patent of the United States was prevented or curtailed by any order of an agency of the Government prohibiting or limiting the production or use of any class of machines, articles, or materials, or the use of any class of processes or formulas,
>
> then the term of such patent may be extended in accordance with the provisions of this act.
>
> * * * * *
>
> (d) The periods during which one or more of the circumstances described in subsection (a) must have occurred in order to qualify a patent for extension under this act are as follows:
>
> (1) The period beginning May 27, 1941, and ending December 31, 1945.
>
> (2) The period during which the Selective Service Act of 1948 or the Universal Military Training and Service Act is in effect.
>
> (3) The period during which title I of the Defense Production Act of 1950 is in effect.

H.R. 4944, April 30, 1933 (Mr. Utt). It was similar to H.R. 323 (82d Cong.), described supra, p. 164.

b. Hearings

Hearings were held on the above bills, before Subcommittee No. 3 of the Committee on the Judiciary, House of Representatives, on June 10, 1953.

(1) *Hamer H. Budge* (pp. 10–11) spoke in favor of H.R. 1228, contending that the extension privilege should be available to the person who retained a substantial interest in his patent even though he had made an assignment thereof, just as though he were the sole owner as specified under present law.

(2) *Irving Potter*, president, Patent Equity Association, Inc. (pp. 12–27), testified in favor of H.R. 3534. He pointed out that the constitutional provision allowing the grant of patents for limited times did not speak in terms of "limited times during peace," or "limited times to be abridged during war." He described the hardships his company endured because of Government stop orders during the war. He pointed out that, although the Potter refrigerator was developed by his company, other manufacturers made millions on the invention, while his backers had their business entirely wiped out due to Government stop orders.

(3) *William R. Ballard*, National Association of Manufacturers (pp. 37–40), opposed H.R. 1301, 2309, and 3534, on the ground that they would have the following bad effects on the patent system:

> (1) From the fact that owners of patent rights—one species of property—would be singled out for preferred treatment, which is unfair to the owners of other kinds of property; (2) from the resulting uncertainty as to the expiration date of patents, and the consequent difficulties for business enterprises in planning their future activities; and (3)

from the further overloading of the Patent Office by a flood of applications for extension, to the detriment of its important business of handling applications for patent.

(4) *Willard Hayes*, chairman, Committee on Laws and Rules, American Patent Law Association (pp. 46–50), presented the objections to the bills by his association, which ran along the same lines as previous testimony.

(5) *Dr. Edwin Armstrong* (pp. 64–71) eloquently described the patent system as follows:

> In the previous hearings Abraham Lincoln was quoted as having said that "The American patent system added the fuel of self-interest to the fire of genius". To my mind that statement expresses the true function of the patent law in our economic system—to provide incentives for the making of inventions.
>
> Many people who would agree with that statement, however, do not look beyond the making of a single invention and rewarding the inventor for it. I suggest that there is a good deal more than that to the matter of providing incentives. From the standpoint of the individual inventor, the important thing about rewarding the inventor is to provide him with the resources with which to make the next invention. That is the aspect of the matter that is of public importance. For if inventions were ever needed, they are needed now, world conditions being what they are.
>
> The test of any proposal affecting the patent law is whether it will serve as a spur to invention. Applying that test to the proposal which is before your committee, I think it is a meritorious proposal. It would provide a good many inventors, I believe, with the means with which to go on inventing. And last, and perhaps most important, it would assure the inventors and potential inventors of the country that the Congress is mindful of the importance of their work and wants them to reap their due reward—not for the sake of the reward but for the sake of going on and making other inventions.
>
> There are those nowadays who belittle the role of the individual inventor and say that research has become so complicated and so expensive that it can only be carried out by large laboratories, such as those maintained by the major industrial organizations. That is not in accord with experience. Many inventions, of course, come out of the industrial laboratories, and there are certain types of problems which only they can work on effectively, because of the amount of money involved. But in the many fields where the capital requirements are not too great, it has been proven over and over that man for man and dollar for dollar, the individual inventor repeatedly outstrips organizations with hundreds of times the manpower and numberless times the financial resources. My point is not that either kind of inventive effort must give way to the other; my point is that the country needs both kinds of effort.

Now, I do not believe that my own experience is at all unique and therefore I will illustrate the point by reference to my FM inventions. You all know we now have radio without static; that we have coast-to-coast transmission of television signals; that police, fire, and emergency vehicles keep in constant touch with their headquarters by radio, and that may hundreds of long-distance telephone conversations travel between cities over a single beam and that those radio beams are rapidly replacing wires. All of those services are based on the radio system that eliminates static from the signal, popularly known as FM.

Now, when I invented the system of frequency modulation which produced noise-free radio signals, many others had been working in that field, among them the largest and best radio laboratories in the world—General Electric, Westinghouse, RCA, the American Telephone & Telegraph Bell Laboratories, and the great German Telefunken Co.

Their results were entirely negative. The general opinion among radio engineers about the possibility of a static eliminator was expressed by John R. Carson, the telephone company's ablest mathematical physicist, who wrote in a technical journal in 1928, and demonstrated mathematically, that the problem of static was insoluble. Now I quote from his conclusion:

"As more and more schemes are analyzed and tested, and as the essential nature of the problem is more clearly perceived, we are unavoidably forced to the conclusion that static, like the poor, will always be with us."

That was in the proceedings of the Institute of Radio Engineers in 1928, just 5 years before static was eliminated.

* * * * *

On another occasion, commenting on frequency modulation, in which the solution of the noise problem was found, Mr. Carson stated that frequency modulation "inherently distorts without any compensating advantages whatsoever," That statement, of course, was approved by the management of the greatest communications company in the world, the American Telephone & Telegraph Co., because no statements go out until they are approved by the patent department of that corporation—or of any other of the large corporations, for that matter.

When the problem was finally solved, and the static in broadcasting reduced 1,000 to 1, it was in a small university laboratory, with a staff consisting of one laboratory assistant and one secretary and myself, at the Marcellus Hartley Laboratory at Columbia University.

I have heard recently of a case where a development now used in jet-airplane engines was made by a single metallurgist with three or four laboratory assistants, after the largest metallurgical laboratories specializing in that particular field—laboratories maintained by two of the largest corporations in the country—had worked on the job and reported that it was impossible of accomplishment.

So I say that the function of the individual must not be underestimated, and that the provision of liberal incentives for him is a matter of public importance.

There are some other considerations affecting the rewards of inventors that your committee may want to take into consideration.

In many cases the 17-year life of a patent is purely theoretical. It takes time for a new invention to be accepted, especially if it is important and would involve major changes in industry practices or installations. My FM patents, for example, were issued in December 1933. They were greeted by the industry with skepticism, and it was 5 or 6 years before it was generally accepted that the FM system would do what I said it would, and it was 1939 before I received a cent of royalties under the patents. So in measuring the effect of war restrictions in that kind of a situation, the effective life of the patents is really about 10 years, instead of 17.

There is another point that I just want to pass over briefly. That is that quite a number of patentholders gave free licenses for Government purposes during the prewar emergency period and the war. In my case, I initiated that policy in the radio field in March of 1941 by giving a free license to the Army and the Navy; and there was a quarter of a billion dollars of equipment made during the period of the war, from those.

I would like for the record to show that the FM system was used universally in all mobile communications of the U.S. Army during World War II, and was employed with great effectiveness during the later amphibious operations in both the eastern and European theaters of war.

There is another problem to which the representatives of the American Patent Law Association did not direct your attention. On account of the numerous fields where Government controls operate, an inventor may have his reward diminished or reduced to zero by bureaucratic fiat. While my own experiences may not be typical, at least it is illustrative of problems that are increasing for the inventor.

My FM system had been tested and demonstrated and was ready to go into public use before 1936. But in 1936, when the Federal Communications Commission was called upon to provide wavelengths for it, the assignment in the then usable part of the radio spectrum was only five channels. Nothing remotely approaching a nationwide system of FM broadcasting could be built upon five channels; and there—and for the further reason that the service was made "experimental," so that nobody could derive a cent of revenue out of it—the Commission deprived it of all immediate commercial attraction to the big broadcasters.

Hence, the large interests in broadcasting stood pat, and left it to the inventor and some of the less favored broadcasting interests to exploit the FM system. It was not until May 1940, that the Commission made FM broadcasting "commercial" and assigned additional (but still insufficient) radio channels to it.

Now, the retarding effect of the Commission's action befor the war may be attributed to inertia, to the failure of the industry to keep itself and the Commission adequately informed, and, perhaps, to the natural caution of a regulatory body in dealing with new things. But after the war the Commission put another damper on the development of FM, which cannot be explained on any of the grounds that I have mentioned.

Contrary to the unanimous recommendation of the radio industry, and relying on the testimony of a Government engineer who made certain predictions as to the probable behavior of radio waves—predictions which were later proved and admitted to be wrong—the Commission made a drastic change in the wavelength assignments for FM broadcasting; so the job had to be done all over again.

In that manner a period of about 2 years was cut off the effective life of the patents, which at the end of the war had only 5 years to run.

I am sure that your committee can find many other examples where Government by bureaucratic fiat has cut down or even destroyed by action of other branches of the Government.

In the case of the FM patents, the royalty-producing period was about a year before the war and about 4 years after the war—or a total of 5 years, instead of 17. I make no complaint about the past, but it is something in the future your committee will have to deal with because 17 years is all too short a time to exploit a really important invention under government by commission.

There is one thing that I would like to comment on and then I will conclude. The National Association of Manufacturers said that one of the most important things about a patent is the date on which it expires. I would like to meet that statement head on by saying that the important thing about a patent is the date it is issued and shows the public something new—how to do something new that they did not know how to do before.

By the time the patent has expired the royalties that accrue to the inventor are usually down to 1 or 2 percent, no particular factor at all as far as any burden on the public is concerned; and likewise at the time everyone who wanted to, has already gotten a license.

(6) *Roberts B. Larson*, patent attorney (pp. 72–74), testified in favor of H.R. 1228. He felt that existing law was unjust to veterans who had entered into assignment agreements, but still held substantial rights in their patents.

(7) *Harry H. Hitzeman*, patent attorney (pp. 76–84), urged the passage of a general patent extension bill, authorizing extensions on the various grounds in the pending bills. He added:

> The only just and sensible way for this Government to live up to its contract with inventors and patent owners is to assure them, by the passage of a general patent-extension law such as H.R. 1301, that they are guaranteed of no interfer-

ence with their right to patent protection for a definite period of time, regardless of how often it would be interrupted by national emergencies or other conditions. Maybe that is why, in the Constitution, it provides that patents shall be granted for periods of "times," and the word is used in the plural.

The guarantee of this patent protection does not require an appropriation of any moneys by the Congress, but reinstates a right or a remedy for the breach of the original contract the inventor had with the Government.

(8) *The Patent Law Association of Chicago* (pp. 113–114) presented its objections as follows:

In general, these bills violate the fundamental patent-law concept of giving the public the right to use an invention at the end of a stated period of time. These bills substitute for the public's right to compete after a fixed period a windfall right to the patentee for making additional profits, and places upon the public a commercial adversity due to the fact that the patent can be extended. This is not the promotion of science to which the patent laws should be directed.

These bills are an unjustified outgrowth of the act of June 30, 1950. This act authorized extending patents wholly owned by armed-service men. Its justification was patriotic. The right of extension expired June 30, 1951. By the act of July 1, 1952, the benefits of the earlier act were extended to armed-service men who owned only a part of a patent. The right of extension terminated January 1, 1953. We note that this second bill conferred a windfall on citizens who were not connected with the armed services, but solely with a serviceman. There is no justification for benefiting such individuals.

The bills under consideration have forgotten the armed-services man. They ask for patent extension for private parties who for some reason have not exploited their patent.

Our association opposes the bills because—

1. They represent class legislation, extending preferential treatment to a particular group because of, what we regard, a "risk of business."

2. They substantially increase the administrative burden in the Patent Office without providing the funds necessary to sustain the burden.

3. Several give preferential treatment to the U.S. Government upon extension of the patents. This is contrary to precedent and is unsupported by logic.

4. The constitutionality of these bills is questionable. The Constitution uses the words "limited times" in defining the grant which the Congress might give. These words emphasize the importance of a definite termination date for the patent monopoly. In authorizing the Patent Office to extend patents, these bills do not provide a sufficient standard, as required by the courts, for proper delegation of congressional power. Unlike the act of June 30, 1950, the constitutionality of these bills is not aided by patriotic motives and war powers.

Considering now the individual bills:

H.R. 1228 * * * This bill will enable one unconnected with the armed services to profit by an extension of a patent if he can associate himself in title with an inventor in the armed services. It is without time limit and hence introduces a large number of patents for extension. The patriotic reason supporting the act of June 30, 1950, is lacking here. This is class legislation without justification.

H.R. 4944 * * * These bills violate the spirit of the patent laws. A fixed term provides an incentive to a patentee to introduce his product on the market for the benefit of the public irrespective of what obstacles he encounters. These bills encourage a do-nothing and litigious attitude by a patentee.

These bills are not supported by patriotic considerations, for they are not limited to servicemen. * * *

H.R. 2309 * * *. This is class legislation. Additionally, it penalizes the public for an act which the patentee willingly undertook during the period involved, and the act continues to benefit the person which enjoyed the benefits during the period involved, i.e., the U.S. Government and manufacturers for the Government.* * *

H.R. 3534 * * *. The objections to H.R. 1301 and H.R. 4944 presented above are almost equally applicable here.

c. Committee and other action

H.R. 3534 was reported out, with a number of amendments, by the House Committee on the Judiciary (H. Rept. 2347) on July 20, 1954. Amendments included (1) expanding the provisions for extension of veteran-owned patents to include expired patents, but limiting such cases to situations in which use was prevented or curtailed by the veteran's military service; (2) inclusion of patents under which the Government had received a free license in furtherance of the war effort; (3) requirement that an application for extension of a patent in which a veteran held only a partial interest be joined by the veteran; (4) reservation to the United States of a royalty-free right to use the extended patents, except where the owner was entitled to receive royalites for items furnished exclusively to and used exclusively by the United States; and (5) protection of vested rights which might be affected by the extension.

The committee described the basis and need for the legislation as follows:

> The restrictions on the use of patents which were caused by * * * emergencies took several forms. The induction of owners of patents into the armed services or the voluntary enlistment of such owners for such service resulted in one form of curtailment of their rights to promote and exploit their inventions. Similarly, the issuance by Government agencies of production stop orders and restrictions in the use of machines, articles, materials, or processes may have substantially curtailed or even entirely prevented the normal use, promotion, or development of patented inventions. Still other situations arose where the owners of patents

furthered the interests of the United States and materially assisted in promoting the war effort or defense programs by granting licenses to the Government to use their patents without payment of royalty, or for a nominal royalty, even though the granting of such licenses prevented or substantially curtailed the normal use or exploitation of the patents.

* * * * *

To justify legislation for the extension of the terms of patents on the ground that national emergencies such as World War II and the Korean conflict resulted in the substantial loss of opportunities for the exploitation of such patents, the fundamental distinction must be recognized between the loss of such opportunities for patent exploitation and the numerous kinds of other economic losses suffered by various classes of citizens as a result of such emergencies. The measures taken by the Government in the interest of national defense necessarily caused indirect losses of varying degrees on numerous groups of citizens, creating situations for which there can be no compensation or other remedy provided by Federal legislation. * * *

Yet this general situation affords no justification for not compensating individuals from whom the Government has appropriated specific property. The Government stands in a special relation to such individuals and compensation is paid for property rights taken. In principle, the Government would have no more justification to abridge the special obligations it has assumed in inducing the disclosure and public dedication of inventions in exchange for the Government's assurance of a 17-year period for the exclusive use of such inventions.

H.R. 3534 passed the House on July 27, 1954 (Congressional Record, p. 12303).

The Senate reported out H.R. 3534 (S. Rept. 2265), but when it reached the Senate floor, it was objected to by Senator Gore, and the bill was not voted on.

4. BILLS INTRODUCED IN THE 84TH CONGRESS, UPON WHICH HEARINGS WERE HELD

a. Provisions

H.R. 2128, January 13, 1955 (Mr. Fisher of Texas). It was identical to H.R. 3534 (83d Cong.), authorizing the extension of patents covering inventions whose practice was prevented or curtailed during certain emergency periods by service of the patent owner in the Armed Forces or by production controls.

H.R. 3134, January 26, 1955 (Mr. Reed). This bill was similar to H.R. 1301 (83d Cong.).

H.R. 4700, March 7, 1955 (Mr. Utt). This bill was similar to H.R. 4944 (83d Cong.).

b. Hearings

Hearings were held on the above bills by Subcommittee No. 3 of the House Committee on the Judiciary on March 9, 1955.

(1) *The Department of Commerce* (p. 7) presented a letter stating it would not object to H.R. 2128, if enacted, but it felt that the administrative problem involved in processing demands would be extremely difficult and expensive. It opposed enactment of H.R. 3134.

(2) *The Department of Justice* (pp. 7–8) presented a letter concerning H.R. 2128 which concluded:

> The bill would benefit only some of a group of manufacturers who were prohibited from producing similar articles. Many groups, other than patentees, can claim injury to their business due to the war and war orders. Furthermore, many of the patents that might be extended have expired. The extension and subsequent revival of these expired patents would create inequity in their effect upon investments, commitments and plans made in reliance on the normal expiration of patents. The bill would create uncertainty as to the expiration date of all patents. Persons and corporations who have made plans and preparations to begin manufacture of a patented item when the patent therefor expires should, except in extraordinary cases, be secure in the knowledge that the patent will expire in accordance with its terms and not be extended or revived for an indeterminate period.

(3) *Other testimony* ran along the lines of the hearings in the 83d Congress.

c. Committee and other action

H.R. 2128 was reported by the House Committee on the Judiciary on June 20, 1955 (H. Rept. 1297). The committee pointed out that the general purpose of the bill was to authorize the extension of certain patents for terms comparable to the period that their normal use or development was prevented or substantially curtailed as a result of World War II or the Korean conflict.

Inasmuch as the committee report discussed certain crucial issues attending the extension controversy, these comments are set forth in some detail:

EXCLUSIVE RIGHTS OF PATENTEES

> One of the major issues before the committee was whether the Government, by imposing wartime controls, breached its agreement to secure to patent owners the exclusive right to the full use and control over their inventions for a period of 17 years. The argument was urged that while the patent owner may have been prevented from using a patented invention because of inability to obtain materials, etc., he was nevertheless not prevented by Government production controls from being able to exclude others from infringing on his patent rights.

It is true, of course, that the only statutory grant a patentee receives by the issuance of a patent is the right to exclude others. However, the right to exclude others includes, among other things, the right on the part of the patent owner to waive the exclusion and to grant a license on his patent to others, or to assign or sell the patent to others. If Government stop orders prohibit the using of the patent or prevent the exploitation, promotion or development of the patent so that it cannot be licensed to others, then it interferes with the patentee's exclusive use.

In addition, while a patentee has a statutory grant to exclude others, he also has, coupled with that grant, the common-law right to make, use, and exploit his invention as he sees fit. These two rights go together and, for all practical purposes, the right of exclusive use cannot be enjoyed save with the common-law right. The late Mr. Chief Justice Taft aptly stated the relationship in *Crown Co.* v. *Nye Tool Works* (261 U.S. 24, 36):

"It is the fact that the patentee has invented or discovered something useful and thus has the common-law right to make, use, and vend it himself which induces the Government to clothe him with power to exclude everyone else from making, using, or vending it. In other words, the patent confers on such common-law right the incident of exclusive enjoyment and it is the common-law right with this incident which a patentee or an assignee must have. That is the implication of the descriptive words of the grant 'the exclusive right to make, use, and vend the invention.' The Government is not granting the common-law right to make, use, and vend, but it is granting the incident of exclusive ownership of that common-law right, which cannot be enjoyed save with the common-law right."

An inventor has no legal obligation to reveal his secrets to the world. However, in order to induce him to make known his discovery so that the Nation as a whole may profit thereby, the Government in exchange for his public disclosure and dedication agrees to secure to him the exclusive use of his invention for a full period of 17 years. That is the inducement which the Government has long been offering by law and upon which inventors have been led to rely.

Since the public emergencies of World War II and the Korean conflict forced the Government to abridge the special obligations it assumed by the issuance of patents, it is the considered opinion of the committee that, in order to make good on its original undertaking, the Government should extend the term of such patents for periods corresponding to that during which the normal use or development of the patent was prevented or substantially curtailed.

CLASS LEGISLATION

Another argument raised against patent extension legislation is that such legislation would single out a particular group for benefits, and as such is inequitable and unfair to

the many citizens who inevitably suffered loss of one sort or another during World War II or the national emergency and who were given no compensation therefor. Such an argument, it is believed, if carried to a logical conclusion, would preclude the granting of any relief for the taking of property or for other losses. The U.S. Government, of course, could not provide or attempt to provide relief for all of the casualties of war, financial or otherwise. This fact, however, has not prevented the Congress from granting patent extensions to World War veterans, both after World War I and World War II, nor has it prevented it from making provison for relief for those, having direct contractual relations with the Government, whose position was adversely affected by governmental action. This is exemplified by the statutory provisions for the termination of war contracts. (See, generally, title 41, U.S.C.—Public Contracts.)

Two of the principal examples cited in support of the argument against patent extensions are filling stations, which because of Government controls, could not obtain gasoline, and automobile dealers, who could not secure cars to sell. While such classes of people suffered from the same causes as did patent owners, it must be remembered, however, that unlike patentees, the Government did not agree to secure these persons in any exclusive right, nor did the Government limit the terms of their activities to 17 years. When the actual hostilities of World War II and the Korean conflict were over, filling-station owners or lessees and automobile dealers did not lose their businesses; rather, if they so desired, they could continue and expand their enterprises. They were not required, as is the patentee, at the end of a 17-year period, or at the end of any national emergency, as the case might be, to dedicate their businesses to the public welfare forever.

ESTIMATED APPLICATIONS

Upon request, a representative of the Patent Office furnished the committee with the following statistical data regarding the number of applications for extensions which could reasonably be expected as a result of this legislation. Generally, this legislation would benefit three groups: Section 1(a)(1) relating to veterans and their spouses; section 1(a)(2) relating to patents whose use was curtailed because of Government production controls, and section 1(a)(3) relating to patent owners who granted licenses on a royalty-free basis or at a nominal royalty. The probable number of applications involved, according to the data which follows, would not run into very many thousands.

Section 1(a)(1)—veterans and their spouses—number of cases would be negligible. Laws were enacted in the 81st and 82d Congresses to take care of World War II veterans and there were less than 160 applications under those acts. The only veterans likely to apply under this legislation are Korean veterans.

Section 1(a)(2)—patents affected by Government stop orders: There is no accurate way of estimating the number of applications which would be submitted under this category. Under British patent extension law, which is more liberal, 3⅓ percent of the patents which were eligible for extension applied for such extensions. Using the British 3⅓ percent as a basis, and applying it to the 400,000 U.S. patents which are presently eligible for extension merely from the standpoint of the dates involved, the U.S. Patent Office estimates that there could be about 13,000 applications in this class. This is a top estimate.

Section 1(a)(3)—licenses granted Government on royalty-free or nominal royalty basis: 600 specific patents were given to the Government under this category which have not expired. In addition, 52 companies granted licenses to Government on all of the patents which they owned. No estimate of number of patents involved could be given. Also, the entire radio industry (125 companies) granted licenses to Government in certain designated categories of patents. No accurate estimate could be made on this group. The Patent Office representative estimated that applications under this subsection would not be great—would not go into the thousands.

It should be remembered that any period of extension granted under this legislation would not speak from the date of this act or the date from which any extension is granted by the Patent Office; but rather from the date of expiration of the original term of the patent (sec. 1(b) of this bill). This circumstance alone will virtually preclude any patent the original term of which expired prior to January 1, 1952. The greatest extent of curtailment a patent owner may suffer under this bill, exclusive of a patent owned by a veteran, is about 4 years. Most patents, of course, will be affected for shorter times, since Government stop orders were issued progressively from 1942 as the exigencies of the national emergency increased. An extension of the 4-year term added to a patent which expired January 1, 1952, would bring the patent owner up to January 1, 1956, and would yield him very little or nothing. It follows therefore, that, for practical beneficial purposes, only patents which expire well after January 1, 1952, are worth filing an extension for and then only where the 4-year period of curtailment can be shown.

A minority report of the Committee expressed the following views:

REASONS FOR REJECTING THIS PROPOSAL

1. It singles out patent owners as a preferred class for relief from losses due to wartime controls, which is unfair to others who suffered equally from the same cause, such as filling stations which could not get gasoline and steak houses which could not get steak.

2. It opens up for extension thousands of patents, throws a heavy burden on the Patent Office, and sets up such a vague standard that it leaves too wide an administrative discretion.

3. It would result in uncertainty as to the expiration dates of patents, a matter of great importance to manufacturers who are planning new products.

4. The National Organization of Patent Lawyers is opposed.

5. The National Association of Manufacturers (many of whose members are owners of patents) is opposed.

6. The Department of Justice has reported adversely on this bill.

7. The Bureau of the Budget has voiced the following objections to the bill:

"The Bureau of the Budget further advises that it 'is opposed in principle to using exceptions to the patent system as a method of bestowing benefits on selected individuals or corporations. Benefits under these bills would have little, if any, relation to the injury sustained by the patentee; persons reasonably relying on the terms of a patent might be damaged; administration of the exceptions would present difficulties and may require increased funds for the Patent Office; and extension of patents whose practice was curtailed by production controls would so widen the area of exceptions as to serve as an important precedent for additional exceptions in the future. A great many people were unable to fully exploit their profession or property as a result of production controls. Enactment of these bills would bestow benefits on a very small group of them even though there seems to be no convincing evidence that this group has a specially meritorious claim.' "

8. This bill is now too late. Relief to applicants will depend on events and facts which occurred in 1942–45. The evidence is cold. Witnesses will be unavailable. Bills seeking this relief have been filed in several previous Congresses and have always been rejected. This bill should not be enacted at this late date.

9. The argument for this relief based on justice and equity is a false argument.

The House debated and passed H.R. 2128 on March 7, 1956 (Congressional Record, p. 4227). An amendment was offered to strike out subsection (2), but this was defeated. Subsection (2) provided for extension where:

> (2) the normal use, exploitation, promotion, or development of the inventions described and claimed in any patent of the United States was prevented or substantially curtailed by any order of an agency of the Government prohibiting or limiting the production or use of any class of machines, articles, or materials, or the use of any class of processes or formulas.

The Senate reported out H.R. 2128 (S. Rept. 2704) on July 20, 1956. The report followed the lines of the majority report of the House. The committee believed that the legislation was meritorious and that to amend the bill would result in the loss of any legislation on the subject matter.

44515—60——13

However, the bill was passed over when it reached the Senate floor on July 29, 1956 (Congressional Record, p. 13917), and the legislation did not materialize in the 84th Congress.

A number of bills were introduced in the 85th Congress, but no hearings were held and no legislation ensued.

IV. INDIVIDUAL EXTENSIONS—SPECIAL BILLS

A. ART METAL WORKS, INC. (PRIVATE LAW 554, DEC. 23, 1944)

1. BACKGROUND

Art Metal Works brought an infringement suit under Aronson patent (No. 1,673,727; reissue No. 19,023) against Abraham & Straus, based upon its sale of cigarette lighters manufactured by Evans Case Co. The district court's holding that the patent was valid and infringed was affirmed on appeal. *Art Metal Works* v. *Abraham & Straus*, 61 F. 2d 122 (2d Cir. 1932).

Shortly thereafter, the defense moved to reopen the case for presentation of further evidence. The motion was granted, with Judge Manton presiding. The court suspended the former decision and allowed the case to be further contested by Evans, on the theory that trade announcements by Art Metal Works were so exaggerated and overdrawn in character as to constitute "inequitable conduct" or "unclean hands," which would justify the denial of relief to the patent owner. *Art Metal Works* v. *Abraham & Straus*, 62 F. 2d 79 (2d Cir. 1932).

The reopened proceedings allowed by Judge Manton at the instigation of Evans in 1932 were dragged out until 1934. In the meantime, Evans was encouraged by its relations with Judge Manton to put on the market a still further competing lighter closely similar to that covered by the Aronson patent, whereupon Art Metal filed a new infringement suit in the same court and involving the same parties. In 1934, both suits came before the circuit court of appeals, Judge Manton presiding. Both were decided in favor of Evans and its customer, Abraham & Straus. Judge Manton, speaking for the court, held that the third form of Evans' lighter was not an infringement and that relief to the patent owner for infringement arising out of the first and second forms of Evans' lighter should be denied. *Art Metal Works* v. *Abraham & Straus*, 70 F. 2d 639; same, 70 F. 2d 641 (2d Cir. 1934).

Evans' infringement went on throughout the United States, undisturbed and beyond any power of the patent owner to prevent it until the year 1939, when Judge Manton's criminal acts in the Abraham & Straus litigations were exposed. Judge Manton was found to have accepted a bribe from the Evans Case Co. Petitions were granted to Art Metal to reopen the two adverse decisions previously rendered by Judge Manton. *United States* v. *Manton*, 107 F. 2d 834 (2d Cir. 1939).

The final decisions in this case reversed Judge Manton's decisions, and Art Metal was reinstated to its patent rights. *Art Metal Works* v. *Abraham & Straus*, 107 F. 2d 940; same, 107 F. 2d 944 (2d Cir. 1939); cert. den. 287 U.S. 657.

2. H.R. 2994, JUNE 17, 1943 (MR. HARTLEY)—78TH CONGRESS

Because of the 7 years in which Art Metal was deprived of its rights through judicial corruption, H.R. 2994 was introduced by Representative Hartley to extend the Aronson patent for 7 years.[117]

a. Hearings

Hearings were held before the House Committee on Patents, October 13, 1943. Those appearing included the following:

(1) *Representatives Hartley* and *Keogh* supported the bill, pointing out that because of the unusual circumstances of the case, it would not set a precedent for extending the life of patents. They felt that because Art Metal lost its rights due to corruption in one branch of the Government, it should be granted relief by this act of Congress.

(2) *Kenneth S. Neal*, attorney for Art Metal, recited the history of the litigation with respect to the recovery for damages. The following exchange with Representative Busbey occurred:

> Mr. BUSBEY. A point of information, Mr. Chairman. There are two questions going through my mind. You said that they sold between $10 and $12 million worth of these lighters?
>
> Mr. NEAL. Yes, sir.
>
> Mr. BUSBEY. What is the actual sum that the Art Metal Works recovered from Evans Case?
>
> Mr. NEAL. We entered into a license agreement with them in 1940, which seemed to be the only feasible way of getting anything out of them.
>
> Mr. LANHAM. Whatever you got there, you got under your patent rights?
>
> Mr. NEAL. That's right, sir, due to the restoration, so to speak, which the court of appeals ultimately reinvested us with. We got $50,000 in cash at the closing of that agreement, and we got royalties of * * * 5 percent.
>
> * * * * *
>
> Mr. BUSBEY. They are still manufacturing these lighters?
>
> Mr. NEAL. Yes, sir; by our license.

(3) *Attorney General Francis Biddle* opposed the bill, summarizing his objections as follows:

> * * * the proposed bill should not be passed (1) because it would award the patent owner a compensation disproportionate to the damage suffered, for which the patent owner has already voluntarily settled with the infringer; (2) because the burden of the proposed extension would fall upon innocent members of the public who received no benefit from the 1934 decisions, and possibly also upon competitors of the patent owner who may have scrupulously respected the monopoly during its 17-year term, but meanwhile reasonably made plans and investments for production of the patented device after expiration of the patent; and (3) because an undesirable precedent would be set.

[117] H.R. 2994 was a substitute for H.R. 2898, previously introduced by Mr. Hartley on June 7, 1943.

(4) A letter from *Henry Lederer & Bro.*, a jewelry corporation, said that extending the life of the patent would deprive Lederer and others of rights to commence manufacture of the lighter.

(5) *The American Patent Law Association* asked the question, if the judiciary had been culpable and the patent owner had suffered a loss, "could not the amount of this loss be ascertained and a private bill for 'liquidated damages' introduced, in order to redress the owner of the reissue patent?"

(6) *Other opposing witnesses* included Conder C. Henry, Assistant Commissioner of Patents, and the American Bar Association.

b. Committee and other action

Both the House and Senate committees reported favorably on H.R. 2994 (H. Rept. 1433 and S. Rept. 1277). The House committee felt that the equities in favor of the owner heavily outweighed arguments advanced by opponents. The committee was of the view that the legislation was without precedent in the history of patent legislation and that no comparable future situation would ever arise. Since the owner was wrongfully deprived of his rights because of wrongful acts of an agency of the Government, the Congress properly might restore those rights by the enactment of this bill.

The bill passed both Houses and was signed into law December 23, 1944, as Private Law 554, extending for 7 years the term of the patent.

B. ELBERT R. ROBINSON PATENTS

1. BACKGROUND

A number of bills were introduced over a period of years to revive and extend for a period of 17 years from the date of passage of the act, a number of long-since-expired patents originally granted to Elbert R. Robinson, deceased. The purpose of the legislation was to provide means for possible compensation to some thousands of noteholders who had supplied funds to Robinson to carry on suits charging infringement of the patent. Because these noteholders were hopeful of receiving some return on their notes, and were paying fees or contributing money for this end, the Committee on Patents wished to settle the situation once and for all.

2. BILLS INTRODUCED

a. Bills introduced in the 74th and 75th Congresses

H.R. 8015, May 10, 1935 (Mr. Reed), 74th Congress.
H.R. 12982, June 15, 1936 (Mr. Reed), 74th Congress.
S. 4783, June 16, 1936 (Mr. J. H. Lewis), 74th Congress.
H.R. 5748, March 17, 1937 (Mr. Reed), 75th Congress.
H.R. 6980, May 11, 1937 (Mr. Andresen), 75th Congress.
H.R. 6009, March 30, 1937 (Mr. Andresen), 75th Congress.
S. 2908, August 4, 1937 (Mr. J. H. Lewis), 75th Congress.
No action was taken on any of these bills.

b. H.R. 7685, September 25, 1939 (Mr. Reed), 76th Congress

H.R. 7685 provided that letters patent originally issued to Robinson be "revived and extended in the names of Steve Kalisz and Stella Lakomski, * * * present owners of the same, for further periods of 17 years each from the effective date of this act * * *."

c. H.R. 9341, April 10, 1940 (Mr. Maciejewski), 76th Congress

H.R. 9341 provided that the letters patent "be revived and extended in the name of John T. Hanisch, John J. Komaracki (et al.) * * * each individually and as a fully appointed member of a committee representing some 760 other holders of E. R. Robinson notes for the use and benefit of the said noteholders in proportion to the amount of notes which they hold and for the use and benefit of any other noteholders as their interests may appear, for further periods of 17 years each from their respective dates of their expiration."

3. HEARINGS

Hearings were held May 17, 1940, on H.R. 7685 and H.R. 9341, before a subcommittee of the Committee on Patents of the House of Representatives.

Witnesses included the following:

(1) *Hugo Radau,* Chicago (pp. 3–8), representing Steve Kalisz and Stella Lakomski, owners of five patents originally issued to Elbert R. Robinson, testified in favor of extending the patents. He described how the Car Wheel Association, composed exclusively of Elbert R. Robinson noteholders, got title to the patents and would transfer 49 percent of whatever amount might be recovered, if they were successful at getting this legislation enacted, to the Car Wheel Association.

Representative Edelstein asked,

> What was done in order to have that association to get 49 percent?

Dr. Radau replied:

> The owners of these patents by themselves, that is, Mr. Kalisz and Mrs. Lakomski transferred at their own free will, without any remuneration, and without any promise at all to these noteholders, because it is a fact, the reason why they did, all of them, Robinson in his lifetime did issue these notes which are really all outlawed and do not amount to a row of pins, and he collected about $2,500,000 from people that are very poor. If they have to spend a dollar they feel it. The American Car & Foundry Co., which has used these patents from the very beginning, of course, made an awful pile of money. The noteholders consider, "Well, we contributed $2,500,000 to the inventor, to the patentee, who got at least something, and we did not get a cent, and the notes are bad." We cannot do anything unless somebody buys up the patents for what they are worth. It is only the title. The patents became public property, and they help us save at least some of

the money which we invested. Kalisz and Lakomski did do that. They bought up these patents from the heirs of Stanley Hoffman, and they are here asking this committee to renew them. So, they are willing, although they paid their own money for these patents, to give 49 percent if anything is recovered. We have not gotten anything yet, but if anything is recovered, 49 percent goes to the noteholders.

(2) *Steve Kalisz,* (pp. 8–13) was questioned about the financial arrangements of the Car Wheel Association. There was an initiation charge of $3 per member and a charge of $1.50 every month. Mr. Edelstein commented that to organize an association and get a $3 initiation fee and a $1.50 a month from—

each one of these persons with the hope that a bill might be passed * * * does not appeal to me, and I have been practicing law in New York where we have a large foreign element, and in my opinion it is simply not right.

(3) *Representative Anthony F. Maciejewski* (pp. 13–14) said:

My main object in introducing this bill is to try to stop those collections of money throughout my entire district. There was something like 9,000 original noteholders and the people claimed they had rights in this so-called patent or patents. Out of that I understand there are only 1,700 left. * * *

The statement was made that something like $2,500 000 has been collected. It was collected out of people of very small means, people out there that are poor. I am told that 80 percent of those people are hard-working people. Americans of Polish descent, and who are living on hopes that some day they might be able to get these moneys back that they have paid in there, and they continue giving, and giving, and for that reason, as I said, I would like to get a decision in my bill H.R. 9341, and regardless of how this committee is going to act on it I am going to give it proper publicity in that community and try to stop the collection of money once and for all.

(4) *John T. Hanisch* (pp. 14–16) told of the group he represented. They had no organization, nor dues, but voluntary contributions. He said:

Three-fourths of the people in the organization have the original Robinson notes, that is, they bought the notes originally from him. Others bought them through other hands. I bought my own through other hands. The purpose of my being here is that we want to clear this thing up once and for all. It is getting to be an awful mess. It smells from afar, and if nobody does anything about it now this thing will grow into one of the biggest rackets, as big as the Drake estate.

Mr. EDELSTEIN. When you say it smells you mean that people are being pepped up with the idea that sometime they will realize on it?

Mr. HANISCH. Yes, sir; they have faint ideas that they will realize on what they contribute.

Mr. MACIEJEWSKI. You do want to see this thing finished right now?

Mr. HANISCH. Yes; I would like to see it finished now.

Mr. MACIEJEWSKI. You want to report back to them that there is no chance and no use spending any more money foolishly?

Mr. HANISCH. Yes, sir; that is just it.

(5) *Conway P. Coe*, Commissioner of Patents (pp. 17–19), sent a letter, saying:

> The patents involved expired in 1924, 1925, and 1931, respectively, and the inventions covered thereby have for years been free to the use of anyone. To now revive these patents and establish in certain individuals a monopoly giving them the right to exclude others from making, using, or selling the devices forming the subject matter thereof would inevitably result in injury to the public generally. The bill is subject to the well-known objections to the extension of the patent monopoly beyond the usual statutory period, and does not set forth any circumstances which, to my mind, would justify the extraordinary relief sought.
>
> The enactment of this bill, in my opinion, would establish a dangerous precedent. There would undoubtedly follow a flood of requests for similar legislative relief which, if granted, would lead to utter chaos and confusion in the patent system and in industry generally.

4. COMMITTEE ACTION

The House Committee on the Judiciary issued two adverse reports on July 21, 1940 (H. Rept. 2691 and H. Rept. 2692), on H.R. 9341 and H.R. 7685 respectively. The committee referred to the hearings, noting the several distinct groups, each claiming the right to these expired patents, each seeking to gain their revival and extension, and charging dues or receiving contributions for that purpose. They felt that to withdraw these patents from the public and reinvest them in private ownership would be contrary to public policy, harmful to the general interest, and a dangerous precedent to set.

The committee issued the adverse reports because it had been developed in the hearings that the collection of funds to prosecute the passage of the bills savored of being a racket, and the committee wanted to discourage further collections.

APPENDIXES

APPENDIX A

RULES AND REGULATIONS RELATING TO PATENTABLE INVENTIONS OF EMPLOYEES OF THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

Attachments:

(1) Administrative Order No. 5 of the Government Patents Board approved April 26, 1951 (16 F.R. 3927).

(2) Form NAVEXOS–2374 (Rev. 4–51), Record of Invention and Instructions for Preparation thereof.

(3) Form NAVEXOS–2375 (Rev. 1–47), Disclosure of Invention.

1. *Executive Order 10096.*—By Executive Order 10096 dated January 23, 1950 (15 F.R. 389), the President established a basic Government patent policy with respect to the inventions made by employees of the Federal Government under which the Government may, under certain conditions, acquire title to inventions made by its employees under other conditions. Determination by a Government agency that the Government has or is to take less than full title to an invention is subject to approval by the Chairman of the Government Patents Board established under this order.

2. With a view to obtaining uniform application of the policy set out in this order and uniform organization thereunder, the Chairman of the Government Patents Board is authorized and directed, after consultation with the Board, to formulate and submit to the President for approval such proposed rules and regulations as may be necessary or desirable to implement and effectuate the policies established. Each Government agency is also required to take all steps appropriate to effectuate the order, including the promulgation of necessary regulations which shall not be inconsistent with those approved by the President.

3. *Government Patents Board implementing rules and regulations.*—On April 26, 1951, the President approved certain rules and regulations under Executive Order 10096 which have been issued as Administrative Order No. 5 of the Government Patents Board (16 F.R. 3927), attachment (1). These rules and regulations in section 6 thereof, restate the basic Government patent policy established by the President; and in this section and certain others set forth the responsibilities of Government agencies. The agency responsibilities, among others, include determination of invention, determination of rights in inventions, determination of whether patent protection will be sought in the United States, and the furnishing of certain reports.

4. *NACA responsibilities.*—In carrying out these agency responsibilities for the National Advisory Committee for Aeronautics, NACA

headquarters will be responsible for and with the assistance of patent counsel made available by the Department of the Navy or other appropriate agency, will discharge the following functions:

(*a*) Determine whether the results of research, development, or other activity within the National Advisory Committee for Aeronautics constitute invention within the purview of Executive Order 10096;

(*b*) Determine, subject to review by the Chairman of the Government Patents Board, the respective rights of the Government and of the inventor in and to any invention made by an employee of the National Advisory Committee for Aeronautics;

(*c*) Determine, subject to certain exceptions noted hereinafter, whether patent protection will be sought in the United States by the National Advisory Committee for Aeronautics for such inventions; and

(*d*) Furnish reports as required to the Chairman of the Government Patents Board relating to the determination of rights, the taking of appeals, the filing of applications, and the issuance of patents.

DETERMINATION AND ASSERTION OF RIGHTS

5. *Conditions for assignment.*—The National Advisory Committee for Aeronautics may require assignment of title to inventions made by its employees and to patents that may be issued on such inventions if any of the following conditions are present:

(*a*) If the invention was made during working hours; or

(*b*) If the invention was made with a contribution by the Government of facilities, equipment, materials, funds, or information, or of the time or services of other Government employees on official duty; or

(*c*) If the invention bears a direct relation to or was made in consequence of the official duties of the inventor.

6. *Definitions of conditions.*—In determining whether a condition set forth above was present in the making of the invention, the following definitions shall apply:

(*a*) Working hours shall mean time spent during either the usual working hours, overtime, or both;

(*b*) A contribution of facilities shall mean that the facilities were used in the making of the invention and while so used were made unavailable for other purposes;

(*c*) A contribution of equipment shall mean that the equipment was used in the making of the invention and was thus made unavailable for other purposes;

(*d*) A contribution of materials shall mean that the materials were specifically obtained and used for the purpose of making the invention and were thus rendered unavailable for other use;

(*e*) A contribution of funds shall mean that Government funds were actually expended for the purpose of making the invention;

(*f*) A contribution of information shall mean that the information used in the making of the invention was available only by reason of the inventor's official duties and was obtained from sources not otherwise available;

(*g*) A contribution of time or services of other Government employees on official duty shall mean that their time or services were utilized during working hours as defined in (*a*) above;

(*h*) Bearing a direct relation to or made in consequence of the official duties of the inventor means that the duties to which the inventor had been assigned were such that the invention could reasonably be expected to arise therefrom.

7. *When assignment is required.*—When any of the conditions set forth in paragraph 5, as defined in paragraph 6, are present, the domestic rights and, in the discretion of NACA headquarters, foreign rights in and to the invention shall belong to the Government if—

(*a*) The conditions are equitably sufficient to justify assignment thereof by the employee to the Government; and

(*b*) The Government has sufficient interest in the invention to require assignment thereof by the employee.

If it should be found that assignment is not required under (*a*) and (*b*) of this paragraph, the employee nevertheless shall be required to grant to the Government a nonexclusive, irrevocable, royalty-free license in the invention and under any patents which may issue thereon, with power to grant licenses for all governmental purposes. When none of the conditions set forth in paragraph 5, as defined in paragraph 6, are present, the entire right, title, and interest in and to the invention shall be left in the employee, subject to law.

8. *When conditions are presumed.*—It is presumed that the conditions of paragraph 5, as defined in paragraph 6, are present, when the employee is employed or assigned—

(*a*) To invent or improve or perfect any art, machine, manufacture, design, or composition of matter;

(*b*) To conduct or perform research or development work, or both;

(*c*) To supervise, direct, coordinate, or review Government financed or conducted research work, or both; or

(*d*) To act in a liaison capacity among governmental or nongovernmental agencies or individuals engaged in such research or development work, or both.

9. *Burden of proof.*—Employees within the classes defined in paragraph 8 may submit evidence that will enable NACA headquarters to establish the absence of any one or more of the conditions of paragraph 5, as defined in paragraph 6, or that the conditions which are present are insufficient equitably to justify a requirement that assignment be made to the Government of the invention and any patent which may issue thereon. For employees not within the classes defined in paragraph 8, the Government must establish that the conditions of paragraph 5, as defined in paragraph 6, if present, are sufficient equitably to require an assignment to the Government of the invention and to any patent which may issue thereon.

10. *Foreign rights.*—An assignment of the foreign rights in and to the invention shall be made by the employee, upon request, whenever an assignment of the domestic rights is required. Where, however, an assignment of the domestic rights is not required, an assignment of the foreign rights in and to the invention may be made by the employee, upon request.

APPEALS AND PETITIONS

11. *Appeals.*—Any employee of the National Advisory Committee for Aeronautics who is aggrieved by a determination by NACA head-

quarters pursuant to paragraph 7 may obtain a review of the determination by filing, within 30 days (or such longer period as the Chairman of the Government Patents Board may, for good cause, fix in any case) after receiving notice of such determination, a written appeal with the Chairman of the Government Patents Board and a copy of the appeal with NACA headquarters.

12. In the event of the filing of an appeal, NACA headquarters, subject to conditions of national security, shall furnish the Chairman of the Board in writing, promptly upon the filing of the appeal, the information required by paragraph 7(b) of attachment (1). The decision of the Chairman of the Board upon any appeal taken pursuant to paragraph 11 shall be final.

13. *Petitions.*—In the event that NACA headquarters determines pursuant to paragraph 7 that the domestic rights in and to an invention will be left with an employee with or without a license in favor of the Government, a report of this determination is required to be submitted to the Chairman of the Board for review, subject to the right of the employee, if he acquiesces in the determination, to file a petition in the event of a decision less favorable to him.

14. The Chairman of the Board will review such a determination by NACA headquarters, and his decision respecting the matter shall be final, subject to the right of the employee to submit to the Chairman, within 30 days (or such longer period as the Chairman may, for good cause, fix in any case) after receiving notice of such a decision, a petition for the reconsideration of the decision if it gives to the Government greater rights than the determination made by NACA headquarters. A copy of any such petition must also be filed by the employee with NACA headquarters within the prescribed period.

PATENT PROTECTION

15. *General.*—NACA headquarters, upon determining that an invention has been made under the conditions specified in paragraph 5, as defined in paragraph 6, shall thereupon determine whether patent protection will be sought in the United States by the National Advisory Committee for Aeronautics for such invention. A controversy over the respective rights of the Government and of the employee in any case shall not delay the taking of any action seeking such patent protection. In cases pursuant to paragraph 7 where it is determined that the domestic rights in and to the invention are to be left with the employee, action by the National Advisory Committee for Aeronautics looking toward such patent protection shall be contingent upon the consent of the inventor.

16. *Dispute as to rights.*—Where there is a dispute as to whether the Government is to obtain an assignment of the domestic rights in and to the invention or only a license thereunder, NACA headquarters will determine whether patent protection will be sought in the United States pending the decision of the Chairman of the Government Patents Board on the dispute, and, if NACA headquarters decides that an application for patent should be filed, will take such license rights as are specified in subparagraph 6(b)(2) of attachment (1), but this shall be without prejudice to acquiring an assignment of the domestic rights in and to the invention as specified in subparagraph 6(b)(1) of attachment (1) should the Chairman of the Board so decide.

17. *Rights in the employee.*—Where, however, NACA headquarters has determined to leave the domestic rights in and to the invention with an employee subject to a license in favor of the Government and the employee acquiesces in this determination, NACA headquarters will, upon the filing of an application for patent and pending review of the determination by the Chairman of the Government Patents Board, take such license rights as are specified in subparagraph 9(b)(2) of attachment (1), should the Chairman of the Board so decide.

REPORTING OF INVENTIONS

18. *Employee defined.*—The term "employee" as used herein means any officer or employee of the National Advisory Committee for Aeronautics, including any part-time consultant or part-time employee, except when special circumstances in a specific case require a departure herefrom to meet the needs of the National Advisory Committee for Aeronautics. Such circumstances shall be reported to the Chairman of the Government Patents Board and separately promulgated if approved by him.

19. *Responsibility of employee.*—

(*a*) Whenever an employee of the National Advisory Committee for Aeronautics conceives an idea which he believes to be of a patentable nature he shall prepare a memorandum describing in detail such idea and the means which he proposes for its reduction to practice, and shall submit it through official channels to NACA headquarters together with a formal record of invention and disclosure of invention on forms NAVEXOS 2374 and 2375, respectively, or such other forms as may hereafter be prescribed. The memorandum shall include a statement describing the circumstances under which the invention was made, with particular regard to the conditions listed and defined in paragraphs 5 and 6, respectively, of these regulations.

(*b*) If a decision is reached to proceed with the procurement of a patent, the employee shall cooperate fully with patent counsel in the preparation of a patent application of such scope as will assure maximum protection of the Government's interests, and, subsequently, as may be required from time to time during the prosecution of the application, in the preparation of amendments responsive to Patent Office actions thereon.

20. *Responsibility of laboratory.*—

(*a*) The reporting of patentable inventions resulting from the research activities of the National Advisory Committee for Aeronautics is the joint responsibility of the supervisory personnel and individual employee who conceives the idea upon which the invention is based. A disclosure made by an employee shall be amplified, if possible, by the comments of his supervisors, and shall be transmitted through official channels to NACA headquarters with full information concerning the inventor's employment status and work assignment at the time the invention was made, and with definite recommendations regarding the initiation of patent action, and the respective rights to be claimed for the Government and for the employee.

(*b*) To avoid jeopardizing the interests of the Government, the laboratory shall promptly notify NACA headquarters of any public disclosure, by publication or otherwise, of any patentable developments of its employees not already protected by U.S. patent or patent applications.

DETERMINATION OF INVENTION

21. *Invention defined.*—The term "invention" as used herein means any art, machine, manufacture, design, or composition of matter or any new and useful improvement thereof, of any variety of plant, which is or may be patentable under the patent laws of the United States.

22. *When and by whom determined.*—NACA headquarters, with the assistance of patent counsel made available by the Department of the Navy or other appropriate agency, will be responsible for determining whether the results of research, development, or other activity within the National Advisory Committee for Aeronautics constitute invention, and where practicable will make this determination before determining the respective rights of the Government and the employee of the laboratory, together with such other information as may be required.

SCOPE OF REGULATIONS

23. *Inventions covered.*—The foregoing provisions of these regulations apply to any invention made by an employee on or after January 23, 1950, and to any action taken with respect thereto, and with regard to such invention supersedes the patent policy of the National Advisory Committee for Aeronautics dated June 30, 1949. As to inventions made before January 23, 1950, the respective rights of the Government and the employee will be determined under the provisions of the patent policy of the National Advisory Committee for Aeronautics approved October 20, 1944, as amended June 30, 1949.

HUGH L. DRYDEN, *Director.*

OCTOBER 1, 1951.

APPENDIX B

NATIONAL AERONAUTICS AND SPACE ACT OF 1958

PROVISIONS RELATING TO PATENTS, INVENTIONS AND CONTRIBUTIONS AWARDS

SEC. 305. (a) Whenever any invention is made in the performance of any work under any contract of the Administration, and the Administrator determines that—

(1) the person who made the invention was employed or assigned to perform research, development, or exploration work and the invention is related to the work he was employed or assigned to perform, or that it was within the scope of his employment duties, whether or not it was made during working hours, or with a contribution by the Government of the use of Government facilities, equipment, materials, allocated funds, information proprietary to the Government, or services of Government employees during working hours; or

(2) the person who made the invention was not employed or assigned to perform research, development, or exploration work, but the invention is nevertheless related to the contract, or to the work or duties he was employed to perform, and was made during working hours, or with a contribution from the Government of the sort referred to in clause (1),

such invention shall be the exclusive property of the United States, and if such invention is patentable a patent therefor shall be issued to the United States upon application made by the Administrator, unless the Administrator waives all or any part of the rights of the United States to such invention in conformity with the provisions of subsection (f) of this section.

(b) Each contract entered into by the Administrator with any party for the performance of any work shall contain effective provisions under which such party shall furnish promptly to the Administrator a written report containing full and complete technical information concerning any invention, discovery, improvement, or innovation which may be made in the performance of any such work.

(c) No patent may be issued to any applicant other than the Administrator for any invention which appears to the Commissioner of Patents to have significant utility in the conduct of aeronautical and space activities unless the applicant files with the Commissioner, with the application or within thirty days after request therefor by the Commissioner, a written statement executed under oath setting forth the full facts concerning the circumstances under which such invention was made and stating the relationship (if any) of such invention to the performance of any work under any contract of the Administration. Copies of each such statement and the application to which it relates shall be transmitted forthwith by the Commissioner to the Administrator.

(d) Upon any application as to which any such statement has been transmitted to the Administrator, the Commissioner may, if the invention is patentable, issue a patent to the applicant unless the Administrator, within ninety days after receipt of such application and statement, requests that such patent be issued to him on behalf of the United States. If, within such time, the Administrator files such a request with the Commissioner, the Commissioner shall transmit notice thereof to the applicant, and shall issue such patent to the Administrator unless the applicant within thirty days after receipt of such notice requests a hearing before a Board of Patent Interferences on the question whether the Administrator is entitled under this section to receive such patent. The Board may hear and determine, in accordance with rules and procedures established for interference cases, the question so presented, and its determination shall be subject to appeal by the applicant or by the Administrator to the Court of Customs and Patent Appeals in accordance with procedures governing appeals from decisions of the Board of Patent Interferences in other proceedings.

(e) Whenever any patent has been issued to any applicant in conformity with subsection (d), and the Administrator thereafter has reason to believe that the statement filed by the applicant in connection therewith contained any false representation of any material fact, the Administrator within five years after the date of issuance of such patent may file with the Commissioner a request for the transfer to the Administrator of title to such patent on the records of the Commissioner. Notice of any such request shall be transmitted by the Commissioner to the owner of record of such patent, and title to such patent shall be so transferred to the Administrator unless within thirty days after receipt of such notice such owner of record requests a hearing before a Board of Patent Interferences on the question

whether any such false representation was contained in such statement. Such question shall be heard and determined, and determination thereof shall be subject to review, in the manner prescribed by subsection (d) for questions arising thereunder. No request made by the Administrator under this subsection for the transfer of title to any patent, and no prosecution for the violation of any criminal statute, shall be barred by any failure of the Administrator to make a request under subsection (d) for the issuance of such patent to him, or by any notice previously given by the Administrator stating that he had no objection to the issuance of such patent to the applicant therefor.

(f) Under such regulations in conformity with this subsection as the Administrator shall prescribe, he may waive all or any part of the rights of the United States under this section with respect to any invention or class of inventions made or which may be made by any person or class of persons in the performance of any work required by any contract of the Administration if the Administrator determines that the interests of the United States will be served thereby. Any such waiver may be made upon such terms and under such conditions as the Administrator shall determine to be required for the protection of the interests of the United States. Each such waiver made with respect to any invention shall be subject to the reservation by the Administrator of an irrevocable, nonexclusive, nontransferable, royalty-free license for the practice of such invention throughout the world by or on behalf of the United States or any foreign government pursuant to any treaty or agreement with the United States. Each proposal for any waiver under this subsection shall be referred to an Inventions and Contributions Board which shall be established by the Administrator within the Administration. Such Board shall accord to each interested party an opportunity for hearing, and shall transmit to the Administrator its findings of fact with respect to such proposal and its recommendations for action to be taken with respect thereto.

(g) The Administrator shall determine, and promulgate regulations specifying, the terms and conditions upon which licenses will be granted by the Administration for the practice by any person (other than an agency of the United States) of any invention for which the Administrator holds a patent on behalf of the United States.

(h) The Administrator is authorized to take all suitable and necessary steps to protect any invention or discovery to which he has title, and to require that contractors or persons who retain title to inventions or discoveries under this section protect the inventions or discoveries to which the Administration has or may acquire a license of use.

(i) The Administration shall be considered a defense agency of the United States for the purpose of chapter 17 of title 35 of the United States Code.

(j) As used in this section—

(1) the term "person" means any individual, partnership, corporation, association, institution, or other entity;

(2) the term "contract" means any actual or proposed contract, agreement, understanding, or other arrangement, and includes any assignment, substitution of parties, or subcontract executed or entered into thereunder; and

(2) the term "made", when used in relation to any invention, means the conception or first actual reduction to practice of such invention.

CONTRIBUTIONS AWARDS

SEC. 306 (a) Subject to the provisions of this section, the Administrator is authorized, upon his own initiative or upon application of any person, to make a monetary award, in such amount and upon such terms as he shall determine to be warranted, to any person (as defined by section 305) for any scientific or technical contribution to the Administration which is determined by the Administrator to have significant value in the conduct of aeronautical and space activities. Each application made for any such award shall be referred to the Inventions and Contributions Board established under section 305 of this Act. Such Board shall accord to each such applicant an opportunity for hearing upon such application, and shall transmit to the Administrator its recommendation as to the terms of the award, if any, to be made to such applicant for such contribution. In determining the terms and conditions of any award the Administrator shall take into account—

(1) the value of the contribution to the United States;

(2) the aggregate amount of any sums which have been expended by the applicant for the development of such contribution;

(3) the amount of any compensation (other than salary received for services rendered as an officer or employee of the Government) previously received by the applicant for or on account of the use of such contribution by the United States; and

(4) such other factors as the Administrator shall determine to be material.

(b) If more than one applicant under subsection (a) claims an interest in the same contribution, the Administrator shall ascertain and determine the respective interests of such applicants, and shall apportion any award to be made with respect to such contribution among such applicants in such proportions as he shall determine to be equitable. No award may be made under subsection (a) with respect to any contribution—

(1) unless the applicant surrenders, by means such as the Administrator shall determine to be effective, all claims which such applicant may have to receive any compensation (other than the award made under this section) for the use of such contribution or element thereof at any time by or on behalf of the United States or by or on behalf of any foreign government pursuant to any treaty or agreement with the United States, within the United States or at any other place;

(2) in any amount exceeding $100,000, unless the Administrator has transmitted to the appropriate committees of the Congress a full and complete report concerning the amount and terms of, and the basis for, such proposed award, and thirty calendar days of regular session of the Congress have expired after receipt of such report by such committees.

APPENDIX C

Special Acts of Congress Relating to Extensions of Patents

Act of March 3, 1809 (6 Stat. 80, ch. 35).
Amos Whittemore's patent for a machine for manufacture of cotton and wool cards extended for 14 years.

Act of February 7, 1815 (6 Stat. 147, ch. 36).
Oliver Evans' patent for improvements on steam engines extended for 14 years.

Act of March 3, 1821 (6 Stat. 262, ch. 62).
Samuel Parker's patents for improvements in currying and finishing leather extended for 14 years.

Act of March 2, 1831 (6 Stat. 458, ch. 74).
John Adamson's patent for a floating drydock extended for 14 years.

Act of March 3, 1831 (6 Stat. 467, ch. 113).
Samuel Browning's patent for a magnetic separating machine extended for 14 years.

Act of May 19, 1832 (6 Stat. 486, ch. 78).
Jethro Wood's patent for improvements in the construction of a plow extended for 14 years.

Act of June 30, 1834 (6 Stat. 589, ch. 213).
Thomas Blanchard's patent for a machine for turning or cutting irregular forms extended for 14 years. [Amended by act of February 6, 1839 (6 Stat. 748, ch. 14).]

Act of March 3, 1835 (6 Stat. 613, ch. 86).
Robert Eastman's patent for a circular saw clapboard machine extended for 7 years.

Act of July 2, 1836 (6 Stat. 678, ch. 336).
James Barron's patents for improvements in machinery for manufacturing bottle corks, and in pump for air or water, extended for 14 years.

Act of March 3, 1843 (6 Stat. 895, ch. 131).
Extension (apparently for 7 years) of William Gale's patent for improvement in manufacture of silver spoons and forks authorized.

Act of March 3, 1843 (6 Stat. 899, ch. 150).
Samuel K. Jennings' patent for "apparatus for the speedy generation, and convenient, prompt, and agreeable application of heat to the human system" to be renewed for 14 years.

Act of February 26, 1845 (6 Stat. 936, ch. 27).
William Woodworth's patents for improvement in planing, tonguing, grooving and cutting, and for "facing and dressing brick and cutting moldings on, and facing several other substances," extended for 7 years.

Act of May 30, 1862 (12 Stat. 904, ch. 88).
Extension for 7 years of patent of John Goulding for improvement in machinery for manufacture of textiles authorized.

Act of April 1, 1869 (16 Stat. 604, ch. 8).
Extension for 7 years of patent of James M. Miller for improvement in surface condensers for steam engines authorized, on application of Isabella C. Youngs.

Act of February 9, 1870 (16 Stat. 613, ch. 15).
Extension (apparently for 7 years) of Alinzor Clark's patent for fastening for hay and manure forks authorized.

Act of March 15, 1870 (16 Stat. 631, ch. 27).
Extension (apparently for 7 years) of Walter Hunt's patent for manufacture of paper collars authorized.

Act of March 25, 1870 (16 Stat. 631, ch. 37).
Extension (apparently for 7 years) of Thomas Thompson's patent for improved machine for folding paper authorized.

Act of March 25, 1870 (16 Stat. 631, ch. 38).
Extension (apparently for 7 years) of William Mont Storm's patent for improvement in revolving firearms authorized.

Act of April 6, 1870 (16 Stat. 633, ch. 50).
Extension (apparently for 7 years) of Tobias J. Kindleberger's patent for improvement in cider mills authorized.

Act of May 4, 1870 (16 Stat. 636, ch. 78).
Extension (apparently for 7 years) of Augustus R. Moen's patent for improvement of basement, etc., walls, to render them impervious to water, authorized.

Act of July 7, 1870 (16 Stat. 648, ch. 215).
Extension (apparently for 7 years) of John Tyler's patent for improvements in waterwheels authorized.

Act of July 7, 1870 (16 Stat. 648, ch. 216).
Alexander C. Twining's patent for improvement in process and apparatus for making ice to be extended for 7 years.

Act of July 14, 1870 (16 Stat. 656, ch. 291).
John Bachelder's patent for improvement in sewing mechanism extended for 7 years.

Act of July 15, 1870 (16 Stat. 657, ch. 308).
Extension (apparently for 7 years) of patent of Francis M. Strong and Thomas Ross for improvement in platform scales authorized.

Act of January 25, 1871 (16 Stat. 399, ch. 28).
Extension for 7 years of Pierpont Seymour's patent for improvement in seed planters or grain drills authorized.

Act of January 30, 1871 (16 Stat. 401, ch. 30).
Extension (apparently for 7 years) of Joseph Rodefer's patent for improvement in bedstead fastenings authorized.

Act of January 31, 1871 (16 Stat. 401, ch. 31).
Extension (apparently for 7 years) of Arnton Smith's patent for improvement in plows authorized.

Act of May 15, 1874 (18 Stat. 550, ch. 179).
Effect given to extension (apparently for 7 years) of McClintock Young's patent for improvement in harvesting machines.

Act of February 18, 1875 (18 Stat. 630, ch. 85).
Extension for 7 years of Joshua Hathaway's patent for improved device for converting reciprocating into rotary motion authorized.

Act of February 18, 1875 (18 Stat. 630, ch. 86).
Extension for 7 years of John Hazletine's patent for a new water wheel authorized.
Act of March 3, 1875 (18 Stat. 660, ch. 207).
Extension (apparently for 7 years) of Frederick T. Grant's patent No. 28,470 authorized.
Act of April 29, 1876 (19 Stat. 425, ch. 87).
Extension for 7 years of Harvey Lull's patent for a self-locking shutter hinge authorized.
Act of August 14, 1876 (19 Stat. 491, ch. 281).
Extension for 7 years of John R. Harrington's patent of April 1, 1856, authorized.
Act of March 3, 1877 (19 Stat. 538, ch. 150).
Extension for 7 years of Henry Voelter's patent for improvement in reducing wood to paper pulp authorized.
Act of March 3, 1877 (19 Stat. 551, ch. 207).
Extension for 7 years of Erastus T. Bussell's patent for combined rubber and spiral steel spring authorized.
Act of August 4, 1886 (24 Stat. 873, ch. 912).
Extension for 7 years of Henrietta H. Cole's patent for improvement in fluting machines authorized.
Act of March 3, 1887 (24 Stat. 968, ch. 442).
Extension for 7 years of Samuel M. Gaines' patent for "method of teaching the rudiments of chemistry" authorized.
Act of December 23, 1944 (58 Stat. 1095, ch. 738).
Extension for 7 years of patent granted to Art Metal Works, Inc., as assignee of Louis V. Aronson, for cigar lighter authorized.

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